# COAL AGE

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"THE coal-mine operator is the fellow who succeeds in keeping the price of coal up so high that countless poor wretches freeze to death every winter. He is also the man who keeps the price of labor down so low that his helpless employees to obtain the bare necessities of life are compelled to commit their starving children to interminable hours of sunless grind deep down in the bowels of the earth." That is the wail of newspaper paragraphists, while the moving picture film unrolls the same sad story.

What wonder then that whenever a new child-labor law is proposed, the coal operator, fearing fresh insult, refuses to be drawn into the controversy and allows the sentimentalists and the Sunday editors to carry the day.

But now comes the science of Eugenics to the rescue. The mine owner, who formerly cut such a sorry figure with the public at large, is to be allowed to testify, dispassionately, truthfully, and perhaps effectively.

One of the first facts uncovered by Karl Pearson, who was probably the first incumbent of a chair of Eugenics, was that child-labor laws have had a marked effect in reducing a country's birth rate. Few parents are disposed to assume a greater responsibility than that with which they already are weighed down, if their grown children cannot be made to bear a part of that burden. That in itself does not prove that child-labor laws are undesirable, but it puts the sentimentalist somewhat on the defensive and opens the way for sane argument.

So perhaps the operator will be heard when he gives his side of the story.

Well, here's what an operator in Tennessee, where no person under the age of 16 years is allowed to work in any capacity, had to say of the child-labor provisions in his home state:

"*First.* Thirty per cent. of all boys between the ages of 14 and 16 absolutely refuse to allow themselves to be educated. Since they cannot work and will not study, their energies must be consumed in play.

"How do they play? In various ways of course. Here are a few of the sports which immediately suggest themselves to the jobless boys around a mining camp, but I do not attempt to exhaust the full category of their simple pleasures.

"They use the window lights in vacant dwelling houses as targets to test strength of limb and sureness of aim; they borrow mules from the company stables and take long joy rides; they ride the bumpers on incoming and outgoing trains, and experiment as to the destructiveness of dynamite and black powder. Not infrequently, expertness so gained has been utilized in cracking safes in nearby country stores.

"*Second.* Parents urge the operators to allow their boys to work, *in spite of the law*, and in the case of widows dependent on children for support, their requests are sometimes granted. If such a boy is injured while at work, woe be to the employer. The liability companies immediately 'duck from under' since they are protected against illegal employees, and the operator is left to hold the bag.

"If a clever accident attorney 'gets next,' the operator may even lose the bag, for the average jury is not considerate of law-breaking mine owners. This is not a brief for the law-breaker, but any legal act which appears unreasonable and absurd to all parties affected is rarely observed.

"*Third.* Work which should be performed by boys growing into men is necessarily performed by men growing into boys. Somehow it appears that some work was intended for youth by the very constitution of things mundane. To replace them we must press the near cripples and the sorrowful old into service, not solely because they will work for less than more able men, but because the vigorous resent doing a boy's work.

"While the industries of many states are enduring all these unpleasant experiences, the reformers are singing the praises of our commonwealth and telling the world that Uncle Sam is saving his boys for the next generation."

Perhaps some boys were intended for the present generation. We must sometimes choose between child labor and child devilment, when school days are over.

(*This foreword was written by an experienced mine manager. Discussion is invited.*)

# Ideas and Suggestions

**Interesting Talks Submitted in Response to Our Recent Request for Forewords.**

## A Soliloquy on Costs

By Carson W. Smith*

How accurate are your costs? Do they represent what you think they do? Do you believe in them, and trust them, and use them? Are they the costs you want and ought to have for reference and comparison? In fact, do your costs mean anything to you?

Costs are funny things. In fact, what *is* a cost? Your neighbor tells you that his haulage cost last month was 8c. You smile, and say "Fine!" and pity him in your heart for a d—— liar—because your cost was 18c.! The discrepancy is, however, due to the different standards in use. There are many kinds of standards, automobile standards, United States standards and chemical standards; in fact all kinds of standards, excepting cost standards. Would a standard Haulage Cost be worth anything to you and your neighbor? I believe it would be invaluable.

How many items are there on your cost sheet? Twenty-five, maybe? And all carried out to the fourth place—and you get these once a month! I generally lay it aside and look into it more carefully—tomorrow (maybe). What do you do with your cost sheet?

Now I will tell you what I think. I believe that if I could get my hands on the three costs that I am especially interested in, and that if they were standard costs, and I knew just what they represented and also that they were right, and further, if I could compare these with the corresponding ones of the last three months, and had it before me at a glance on a single sheet of paper, I know I would spend a great deal more time over these than with all the other seventeen odd! I wonder, now, if a card system, or something ——.

Did you ever consider the art of advertising? What is successful advertising, anyway? Why, it is simply in *reaching* you! In attracting your attention to something that should interest you! Out of a large store that contains some three million separate articles, how many of them do they put in their big show windows? Just about half a dozen! And they pay a man $10,000 a year to put them there! They say if one sees too many things at a time, he doesn't really see any of them!

I was the timekeeper at a mine once. Later on I was a clerk in the office. During this time I learned lots of peculiar things about what costs are made of. I found that if you were allowed only $200 this month for "Repairs to Buildings," you could easily keep it under that —on the cost sheet. I learned that No. 1 shovel shouldn't have all that oil charged up to it, because some of it probably went to No. 3! Also I discovered the unlimited possibilities of the item "General Expense." Later on "Costs" got to be an awful bore. "Familiarity breeds contempt," I presume. And I suppose that down in Denver our manager and president—and treasurer, too, maybe—used to grow real serious and earnest over these costs, and spend many an hour, when they might have gone to the ball game. Say, did you ever take a cost by the hand and walk down the line with it? Costs are funny things.

*Dacono, Colo.

## One Essential in a Mine Foreman

By Pennsylvania Reader

There are several features necessary in the makeup of a mine foreman that are not found in textbooks, and without which it is impossible to become successful in the coal business.

It seems to me after many years' experience in coal mines and in the handling of men that the essential characteristic is the foreman's ability to form an opinion of the makeup, character and temperament of the men who apply to him for employment.

The mining law holds him responsible for the life of every man who enters the mine. It states that he shall hire no man to mine coal who is not an experienced miner, unless he puts him in the charge of one who is experienced. Since the experienced miner is mining coal for a living, it seems but natural for him to object to this arrangement, unless, of course, the foreman is willing to pay him, which would mean increased mining costs.

Again, there is the careless miner, the fellow who won't timber his place properly, and who, if he escapes being killed by his own carelessness, causes the foreman endless trouble by having falls occur frequently in his working place.

Another type of miner is the man who is never satisfied. He spends most of his time in chasing the foreman around to find out if he is going to pay him for every trifling thing that he meets with in the course of his work. This really is the fellow who doesn't want a "job" but rather a "position" and who is looking for nourishment.

There is also the agitator, the fellow who is always trying to make trouble, his object being to have the other men think that he is just the man they need to fill some soft proposition that they have at their disposal.

Of course, I know that it is no easy matter to man a large mine without getting some of those undesirables. But, at the same time, if the foreman is careful in the selection of the men who apply to him for employment he will be able to save himself endless annoyances and keep accidents and fatalities down to a minimum.

In conclusion, I would say that it is always a safe rule to size your man up carefully and make some inquiries about him before you employ him. By constant observation you will be able not only to remember men's faces that you have not seen in years but also be able to figure up your man's character at a glance.

# Mine Equipment, Repairs and Supplies

By Henry F. Pfening*

In view of the fact that repairs and supplies are important items on the cost sheet of the mine, I would suggest one way by which these expenses may be materially reduced.

Let us suppose that several mines, owned by one company, are located within a radius of ten or fifteen miles. The first question which confronts the manager, is to keep in touch with these plants and obtain an accurate account of all repairs and supplies without the aid

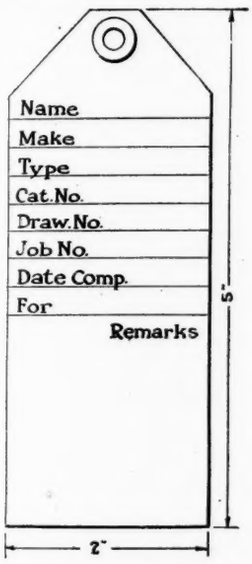


FIG. 1. SHOWING DESIGN OF TAG

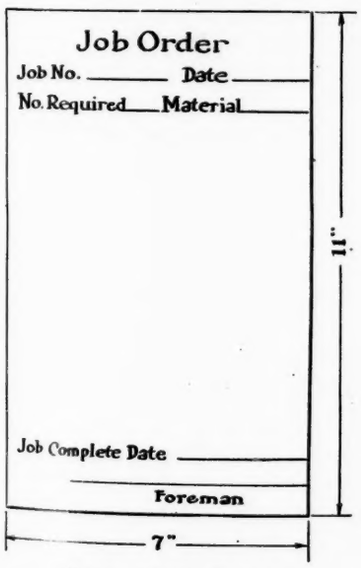


FIG. 2. ORDER BLANK

of several high-priced men. The solution lies in the one word—SYSTEM.

Further, let us suppose that this company has a well-equipped machine shop, located at some central point, or at the place best adapted for receiving and shipping material and supplies. In this shop, we will place a thoroughly competent engineer, one who can design and carry out all work in the mining business which comes before him. He must be a good manager, a careful buyer, and a man who is thoroughly familiar with every branch of the business. He should have absolute control of repairs and repairmen, and all orders for such work or supplies should come through him and his shop, which will be the store house for all the mines. Thus, he will then make what he can, and purchase the rest through the purchasing agent of the company.

### AN ELECTRICIAN ELIMINATED

The expense of an electrician at each mine may be thus avoided by having all the electrical work done through this shop by lower priced mechanics.

A brief description of such a system is as follows: First, there must be drawings of each and every piece that can be made in the shop. Each drawing should be numbered; one set should be kept on file in the shop, and another in the office. Tags should be provided as shown in Fig. 1. When filled out, these contain all the necessary information. The engineer then passes it on to his shop foreman, entering a duplicate of same on his stock and file.

The foreman will then make the piece called for by referring to the drawings, and place the same tag on it.

To enable the foreman to keep track of the cost of each job, an order should be made out on a blank similar to Fig. 2, with the order number, and description of the work, or number of the drawing to be followed.

Place this order where the workman can get it so that when the job is done, he can fill out a time card, Fig. 3. This latter also has a place for material.

The foreman can easily look these over, sign, and pass them in at the office with all the time attached to the order, so that the cost of the job may be readily figured. This cost should then be entered on a card file, so that when the job goes out to the mines, the proper charges can be made against it.

At each mine, there should be a small repair house where all tools and interchangeable parts may be kept and each piece should be tagged. When a piece is used, the tag should be mailed to the machine shop, where the part will be duplicated and sent back to mine without any chance of mistake in number, size, etc.

The repairmen at each mine will have

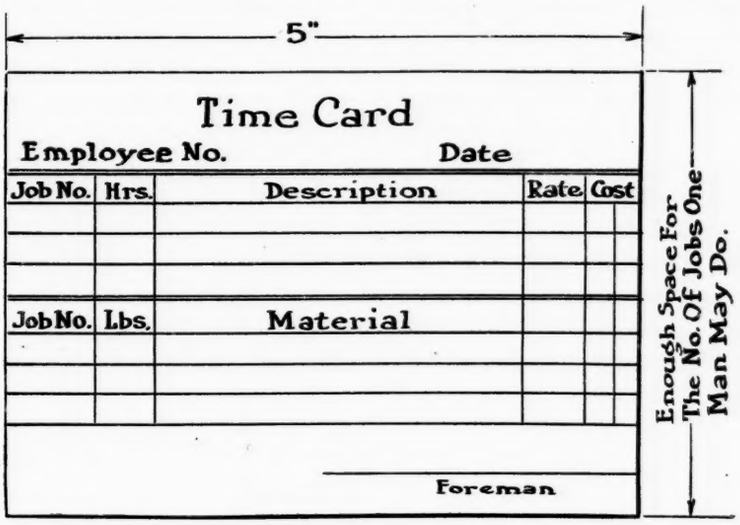


FIG. 3. TIME DISTRIBUTION CARD

nothing to do, except to follow the system, and the mine will never be out of supplies or repair parts.

## Preserving Mine Timbers

Where only a small amount of timber is to be treated the brush method of applying preservatives is feasible and economical, though the results obtained are not as good as by the tank method. A large flat brush and a kettle of hot preservative is all that is necessary for this treatment. The disadvantages of brush treatment are: The difficulty of completely covering the timber and filling all the cracks, and the slight penetration effected.

*Mining Engineer, Paintsville, Ky.

# The Cannel Coal Fields in Kentucky

By H. D. Easton*

**A description of the most important cannel coal field in the country. The product commands a better price than the true bituminous coals and is shipped to comparatively distant markets. The seams are relatively small and carry a grade of very soft coal, while the methods of working are quite elementary.**

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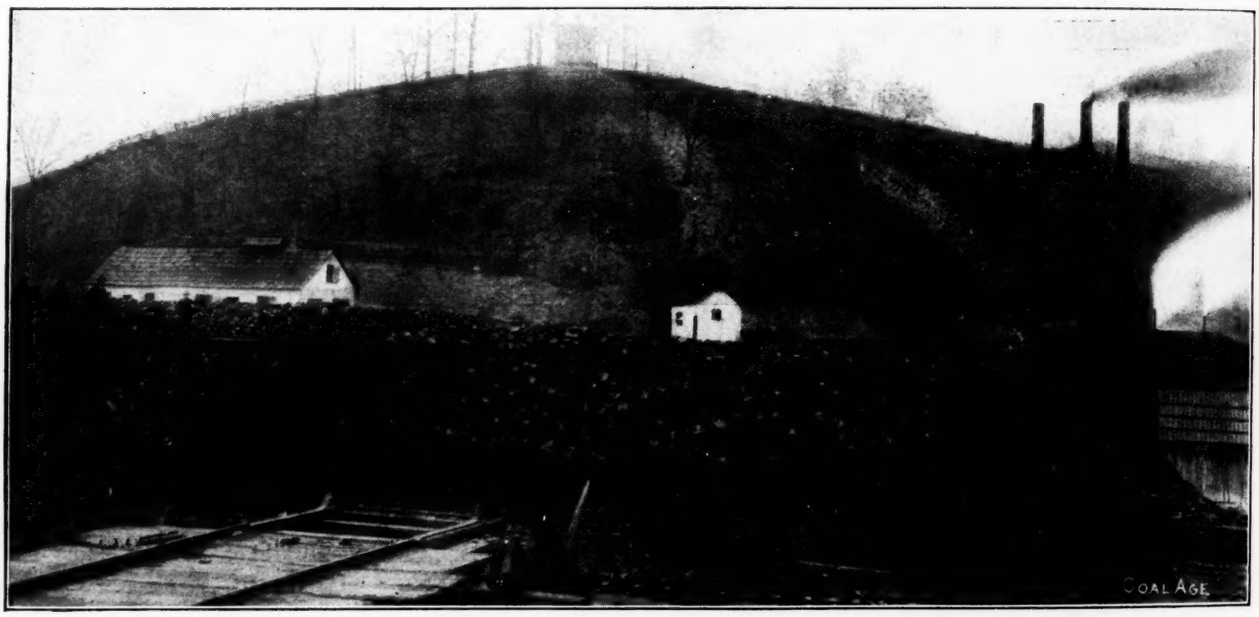
There is but little known and less written about cannel than any other variety. Nearly every publication dealing with the subject of coal and coal statistics fails to mention this grade. Mining engineers and coal men in general are so thoroughly inbued with the belief that cannel coal is always pockety and of little value that their attitude toward it amounts to prejudice.

Practically all of the known cannel coal in the United States is in Kentucky, the best and most persistent beds being in Morgan county. The cannel seams of Kentucky have never been traced out with care or their formation studied with a view of arriving at some definite conclusions as to the conditions under which it was formed. There seems to be but a single article written on these beds, that by Charles Hendrie for the Kentucky Mine Inspector's Report for the year 1893.




POWER PLANT AND STOCK YARD OF THE BLACK CANNEL COAL CO., MORGAN COUNTY, KY.

### DESCRIPTION OF CANNEL COAL

F. Julius Fohs[1] describes cannel coal as follows:

> Cannel is a hard coal usually having a conchoidal fracture and a dull satin lustre. It differs chemically from the other varieties in having a higher content of volatile matter, as well as containing more ash. When not too greatly weathered it will blaze very much like pine upon being lighted with a match. There are three varieties of cannel: the smooth, slick variety, another which breaks with a series of oval depressions known as "birdseye," and a third which breaks with a hackly fracture. . . . Cannel slate is a bituminous shale which, although too high in ash for use as domestic fuel, is of value for gas making, where its content of volatile constituents is sufficiently high.

The name "cannel" comes from the old Lancashire pronunciation of the word candle, cannel coal burning with a big yellow flame that gives much the same light. It does not melt and run down while burning. The superior quality of the high content of volatile matter is the greatest asset of cannel coal.

The close texture and toughness of cannel coal permit it to be worked into ornaments almost as readily as wood. It can be sawed, planed, bored or turned on the lathe. It takes a high polish and, when so treated, exhibits the pinchbeck or irridescent colors when exposed to the direct rays of the sun. Vases and other ornaments of much beauty may be made of cannel coal and these do not blacken the hands when handled.

Cannel coal shows a compressive strength of from 4000 to over 6000 lb. per sq.in. with an average of over 5000. Bituminous coal in general will average but little over 2000 lb. per sq.in. That the compressive strength of coals depends rather upon the structure than the chemical composition seems evident here. The great compressive strength possessed by cannel coal is further shown by the unusually wide rooms, with correspondingly narrow pillars, that are sometimes worked under a strong roof; in some cases the small proportion of coal left would be sure to bring on a squeeze, were the coal no stronger than the general run of bituminous.

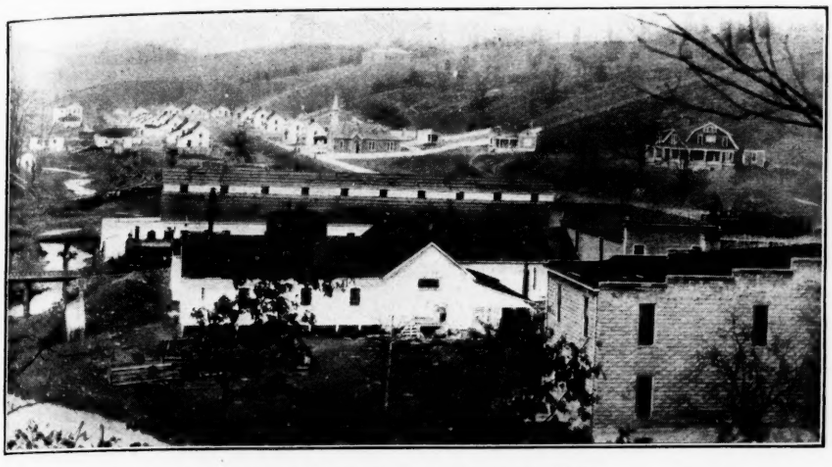
There are no cleats in cannel coal but the beds are made up of laminations parallel to the seam. The large blocks are readily cut up into smaller sizes by the use of an axe, provided a chopping blow is struck so as to split the laminations, or at right angles to them and across the bed; but a blow perpendicular to the laminations and the bed has little or no effect.

### WHERE USED

The ease with which cannel coal is ignited, and the great yellow illuminating flames produced by it, make it one of the best and most cheery coals for use in grate fires; as a domestic fuel it is unsurpassed. Cannel produces more than twice as many British thermal units per pound as does wood which has been dried in the air. Wood, as commonly dried, contains about 25 per cent. moisture, and each pound will produce about 6000 B.t.u. regardless of the kind, since the chemical analysis of the different grades vary but little.

If perfectly dry, wood will give slightly over 8000 B.t.u., but with the usual 25 per cent. of moisture it will show less than 6000 B.t.u. per pound. Hard wood

[1]Kentucky Geological Survey, Bulletin No. 18, page 1.



VIEW OF CANNEL CITY, LOOKING WEST

dried in air, occupies more than three times the space required by an equal weight of cannel; to produce the same number of B.t.u. as obtained from cannel fully six times the space would be required with a corresponding increase of work in replenishing the fire.

As a gas-making coal, the abundance and superior quality of the volatile matter in cannel makes it valuable, while as an enricher for illuminating gas it is the best to be obtained.

The greater portion of that produced in this district is shipped to the Northwest and Canada by the Great Lakes. The Kentucky Block Cannel Coal Co. store their product on the lake docks at Sheboygan, Wisconsin and Duluth, Minn., as well as at several points in Canada. This company has also shipped several cargoes to Rio de Janeiro, Brazil, where a ready market is to be had as soon as transportation is assured.

### MARKETING CONDITIONS

The excellence of cannel coal for the uses mentioned gives it a value far above that of other bituminous coals. The selling value of the total output of 70,998 short tons, produced in Kentucky during the calendar year 1909, was $174,524, or an average of $2458 per ton f.o.b. mine, which was a slight increase over the preceding year. In his report on the "Coals of the Region Drained by the Quicksand Creeks,[2]" Mr. Fohs states that cannel coal will bring at least $2.25 per ton f.o.b. mine.

The leading company in the production of cannel coal is the Kentucky Block Cannel Coal Co. at Cannel City. This company has a bed of superior quality which is marketed under the trade name of "Pluto" Cannel Coal and which was awarded the gold medal at the St. Louis Exposition in 1904. It is quite probable that this firm has the largest output of cannel coal in the world; their production ranges from 4000 to 7000 tons per month, depending upon business conditions and the car supply.

The accompanying photographs show the stock-yards, power plant, weigh house, etc., of this company. The coal comes out in beautiful blocks which are well shown in the photographs. A typical section of the coal horizon here is as follows:

TYPICAL SECTION OF COAL HORIZON

| | Feet |
|---|---|
| Cover | 100 to 200 |
| Slate (gray and gritty) | 6 to 10 |
| Bituminous coal | 0.5 |
| Cannel coal | 2.0 to 2.3 |
| Rash | 0.2 to 0.3 |
| Bituminous coal | 0.5 to 1.0 |
| Sandstone (flinty, very hard but easily disintegrated by weathering) | 3.0 |
| Slate | 2.0+ |

This section shows the seam No. 2 from which the "Pluto" coal is mined; it lies above drainage for approximately two-thirds of the 5600 acres controlled by this company, the remaining one-third being below Caney Creek, a tributary to Licking River.

Another bed of cannel lies about 200 ft. above the No. 2 seam and this has been mined and marketed as a gas-enricher. It runs about 55 per cent. volatile matter, making an unusually rich cannel coal.

The analysis of Bed No. 2, as furnished by the company, is as follows:

ANALYSIS OF CANNEL

| | |
|---|---|
| Moisture | 2.164 |
| Volatile combustible matter | 44.471 |
| Fixed carbon | 45.626 |
| Sulphur | 9.629 |
| Ash | 7.110 |

This cannel is in one solid bed without partings or cleavage planes and in this respect is unlike the cannel found on the North Fork.

### PLANT EQUIPMENT

The equipment of this company consists of a power plant having 300-hp.

PRODUCTION OF CANNEL COAL IN KENTUCKY

| County | 1909 | 1910 | 1911 |
|---|---|---|---|
| Bell | ..... | (1 company) 1,298 | ..... |
| Breathitt | (1 company) 831 | (1 company) 39 | ..... |
| Carter | (1 company) 2,742 | ..... | ..... |
| Johnson | (2 compan's) 7,491 | (1 company) 6,324 | (1 company) 7,752 |
| Morgan | (4 compan's) 59,485 | (6 compan's) 68,447 | (3 compan's) 60,030 |
| Total short tons | 70,998 | 76,108 | 67,782 |

During this period Morgan County has produced more than 87 per cent. of the total output for the State.

BITUMINOUS AND CANNEL PRODUCTION OF MORGAN COUNTY

| Company | 1909 | 1910 | 1911 |
|---|---|---|---|
| American cannel Coal Co., Redwine | .... | 1,145 | .... |
| Kentucky Block Cannel Coal Co., Cannel City | 55,066 | 55,616 | 46,862 |
| Lee Coal Co., Wrigley | 3,877 | 7,165 | 3,591 |
| North Fork Cannel Coal Co., Wrigley | 4,188 | 8,901 | 12,087 |
| Peerless Cannel Coal Co., Cannel City | .... | 615 | .... |
| Watson (J.J) Coal Co., Cannel City | 607 | 753 | .... |
| Total | 63,738 | 74,195 | 62,540 |
| Total cannel | 59,485 | 68,447 | 60,030 |
| Bituminous | 4,253 | 5,748 | 2,510 |

[2] Kentucky Geological Survey, Bulletin No. 18, page 15.

SUPERINTENDENT'S RESIDENCE. BLACK CANNEL COAL CO.

capacity, two Norwalk, compound, air compressors, 24x30 in. and 24 compressed-air punching machines, 6 of which are Ingersoll-Sergeant and the remainder Harrison. A steam locomotive is employed in hauling the coal, in addition to 16 head of mules for inside work. The company owns about 180 buildings, 165 of which are occupied by the employees, the remainder being the commissary, hotel, office building, stables and warehouses. Cannel City is a town of about 1000 people and is the largest in Morgan county.

There are two other important cannel coal companies operating in this county. The North Fork Cannel Coal Co., at Loveland, and the Lee Coal Co., at Morehead. The output of their mines is given in the accompanying table. These two companies are working in the same ridge and have an excellent seam averaging, respectively, 40 and 42 in. in thickness, but reaching 47 or 48 in. in places.

The accompanying table gives the analyses of the bed in comparison with the other Kentucky cannel coals.

Samples Nos. 1, 2 and 3 were taken from the face of the main entry of the Lee Coal Co's. mine No. 1 about 300 ft. from the drift mouth. Sample No. 1 represents the top 14 in. of coal, No. 2 the bottom coal, and No. 3 is an average of the entire bed from top to bottom. Samples Nos. 4, 5 and 6 are from the mine of the North Fork Cannel Coal Co. and probably represent the same portions of the bed as samples Nos. 1, 2 and 3 respectively.

This coal is in two distinct layers, separated by a cleavage plane, the bottom one, as seen by the analyses, being the better.

COMPARATIVE ANAYLSIS*

| Sample | No. 1 | No. 2 | No.3 | No. 4 | No. 5 | No. 6 | No. 7 | No. 8 | No. 9 |
|---|---|---|---|---|---|---|---|---|---|
| Moisture | 1.45 | 1.65 | 1.38 | 1.03 | 1.30 | 1.33 | 1.20 | 1.52 | 1.20 |
| Volatile | 45.25 | 51.80 | 50.19 | 42.12 | 53.25 | 52.72 | 38.75 | 46.08 | 41.80 |
| Fixed Carbon | 28.50 | 33.25 | 32.21 | 27.85 | 33.50 | 32.66 | 34.43 | 42.47 | 46.00 |
| Ash | 24.80 | 13.30 | 16.22 | 29.00 | 11.95 | 13.29 | 25.62 | 9.93 | 11.00 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Sulphur | 1.57 | 1.78 | 1.46 | 2.74 | 1.68 | 1.57 | 0.54 | 0.79 | 0.901 |
| Coke | 53.50 | 46.55 | 48.43 | .... | .... | 29.37 | .... | .... | |
| Spec. gravity | 1.406 | 1.283 | 1.308 | 1.417 | 1.248 | 1.227 | 1.362 | 1.268 | |
| Color of Ash | Brown | Brown | Brown | Lilac | Lilac | Lilac | Gray | Brown | |
| B.t.u. per pound | 12,045 | 13,160 | 12,605 | 11.289 | 13,060 | 12,530 | 10,695 | 12,990 | |

*Kentucky Geological Survey, Progress Report for 1908-09, page 117.

Above the coal is a strong slate some 5 to 6 ft. in thickness and above this is a soft-coal rider about 11 in. thick while above the rider is slate again. The floor is a hard, strong slate resting upon sandstone.

These two companies are mining one of the most uniform and persistent beds of high-grade cannel coal known. Both roof and floor are unusually strong.

Sample No. 7 is a cannel coal from the Popular Lick vein on Hignite Creek, Bell County. Sample No. 8 is from the Sandy River Coal Co., in Johnson County, where the seam is 19 in. thick. Sample No. 9 is Whitehouse cannel also from Johnson County.

### Method of Mining

All of these Morgan County cannel-coal mines are opened by drifts and operated on the single-entry and air course system, with rooms driven off both entry and air course. The beds, except for local rises and swags, are almost level; at the Lee mine the coal dips about 1 per cent. to the north. All inside haulage is by mules and all drainage by hand or siphon. Furnaces are used for ventilating, and, with the exception of the Kentucky Block Cannel Coal Co., no power is used and this company is also the only one not shooting the coal off the solid.

In all cases black powder is used for blasting, being fired by means of squibs. The holes vary in depth from 4 to 6 ft. No shot firers are employed, the miner firing his shot whenever it is ready. This practice of not maintaining regular shooting hours is countenanced because of the unusual safety of these mines.

In the case of the one company using machines, the machine runner gets 33c. and the miner 70c., making a total of $1.03. In shooting off the solid, the miner gets 75c. per ton, for entry driving $2 to $2.25 in addition to the coal, and for air courses and room necks the yardage is 75 cents.

These measures contain no free gas, and the coal makes practically no dust; this means a very remote probability of an explosion occurring. The excellent roof requires a minimum of timbering, hence there is small chance of mine fires and few men are hurt by falling roof. Rooms are often driven fully 65 ft. wide and 150 ft. deep without any timbering to speak of. It is a significant fact that during the four years the Lee and the North Fork companies have been operating not a single miner has been injured.

### Miscellaneous Equipment

The blocks of cannel coal are solid and do not break in handling; this results in strong, sharp corners on the lumps which would prevent the ordinary pit car door from opening. Because of this condition, the doors are made to swing open similar to a gate, or else the end of the car left out entirely. Small cars are used, holding about 1800 lb. of coal each.

View at the Brushy Mine, Showing Block Character of the Coal

As all of this coal is sold as run-of-mine, a quite simple tipple only is required. The coal is weighed and dumped directly into box-cars or is thrown out on the stock piles. Several cars are loaded at a time, box cars being used nearly altogether, and the loading being done by hand. The loader uses an axe continually to split off any pieces of slate that may be adhering to the cannel and to make the blocks fit snugly together in one compact mass. Cannel coal resembles slate so closely, when seen by the light of a pit lamp, that it cannot be entirely cleaned in the mine.

Cannel suffers almost no loss by deterioration or weathering even when exposed to outdoor conditions for years. It does not disintegrate and is not subject to spontaneous combustion.

While there is a great deal of cannel coal scattered over eastern Kentucky, yet, in all likelihood, Morgan County will continue for years to come to be the chief producer of the best grade of cannel coal.

# Bellevue Explosions, Alberta, Canada

## Special Correspondence

**Sterling and Cadman endorse Hudson's conclusion as to the cause of the Bellevue explosion. Not only was the rock siliceous but enough bituminous matter was mixed with it to intensify its dangerous qualities. Perhaps a small percentage of ethane aided the explosion by its greater sensitiveness to heat.**

A paper prepared by John T. Stirling, mine inspector, Alberta, and John Cadman, professor of Univ. of Birmingham, Eng., was presented on Sept. 11, 1912, at the 23d annual meeting of the Institution of Mining Engineers (British). The subject was "The Bellevue Explosions, Alberta, Canada: An account of, and subsequent investigation concerning, three explosions produced by sparks from falls of roof." In brief the paper is as follows:

We believe that the circumstances attendant on a series of explosions at the Bellevue mine during the years 1910 and 1911 are of considerable importance and interest and we hope to show that they resulted from the ignition of inflammable gas by sparks which were emitted by stones on falling.

### The Glow Succeeding a Fall

When removing pillars, in the room-and-pillar workings of the North of England, a glow has been observed in the mined-out areas on the falling of the roof and cases are known in which gas has been ignited by the spark from a pick. Indeed a case is recorded by Mr. Miles of a collier igniting gas in 1880 at Pentre (Glamorgan) in this way, and doubtless there are many other cases.

In a paper read by Edward Edwards before the South Wales Colliery Officials Association, an instance is described of an explosion in the Maindy mine of the Ocean Colliery Co. on Nov. 8, 1896, and the following account is reproduced from the journal and proceedings of this association:

### The Discovery of an Explosion

"The accompanying section and plan (Figs. 5 and 6) explain the circumstances. Gas is now and was then known to occur on the tops of falls in the Maindy workings. The seam had not been worked for a period of 12 months before the explosion occurred and there was in consequence little coaldust on the roadways.

That an explosion had taken place was made evident by the débris which had fallen and the havoc which had been wrought in the roadways. A certain fall was subsequently allocated as the point of ignition. It was found that this fall was recent, and as gas was present in the hole it was thought that the explosion was due to the ignition of gas by sparks which were produced when the rock fell.

By rubbing pieces of the rock together visible sparks were formed. W. J. Heppell described some experiments which he had conducted with the stone. A box was made measuring 3 ft. x 3 ft. 3 in., with a shaft passing through it, and an arm attached, to which stones were fixed

Gas was brought from the mine and mixed with air in explosive proportions. One stone was fastened to the arm and the other to the box. Explosions occurred when the stones struck. Dust was also tried, but no ignition occurred."

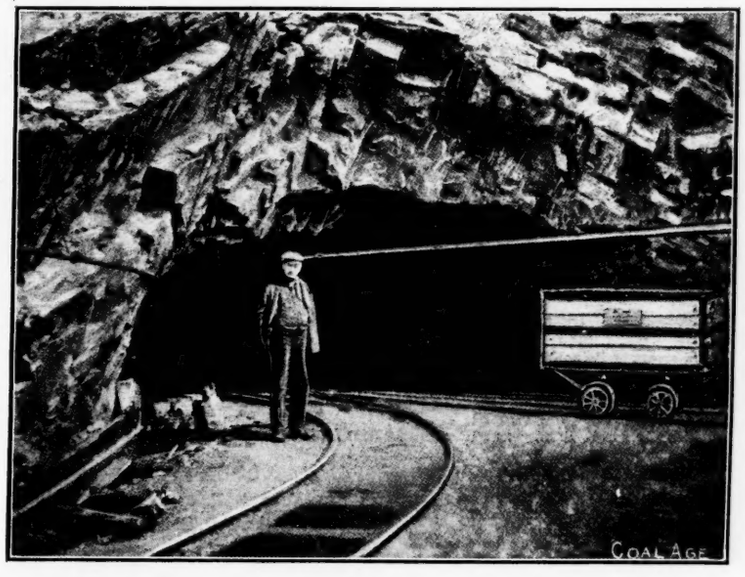



Fig. 1. Entrance to the Bellevue Mine, Alberta, Can.

### The Bellevue Mine Had Steep Pitches

The Bellevue mine is one of a group of three mines worked by the West Canadian Collieries, Ltd., and is situated on the Crow's Nest Pass branch of the Canadian Pacific Railway, about half a mile east of Hillcrest station, and about 2 miles east of Frank. The mine employs about 200 men on three shifts, and the output is from 800 to 1000 tons per day. The entrance to the mine is by an opening in the hillside.

Four beds, known as Nos. 1, 2, 3, and 4, are intersected at distances 135, 258, 350 and 500 ft. respectively from the mine entrance, and they dip at an average inclination of 45 deg. No. 1 bed has an approximate thickness of 13 feet, with a hard siliceous roof and it was in this seam that the explosions occurred.

The workings of the mine are reached from a cross-measure drift which intersects bed No. 2 at a distance of 120 ft. from the side of the hill. From this point a level driven in No. 2 seam at a distance of 3800 ft. meets a fault; and a cross-measure drift is set back to recover No. 1 seam.

At the point where the drift cuts bed No. 1 coal 14 ft. thick was found. A level 10 ft. wide by 7 ft. high, has been driven along the strike of the seam for a distance of 5000 ft. from the cross-measure drift. The total distance from the entrance of the mine to the far end of this level is therefore some 9000 ft. (Fig. 4).

### The Level Which Was Scene of Explosion

Parallel with, and 40 ft. to the rise of the main level is an airway or counter gangway 6 ft. wide and 6 ft. high. At intervals of from 30 to 150 ft., rises or chutes, 20 ft. in width, have been driven up, with crosscuts every 50 ft., thus cutting up the area into pillars.

The chute in No. 1 seam nearest the cross-measure drift is numbered No. 1. That at the extreme inby end is No. 127. The development of the mine has not followed systematic lines, so that irregular pillars and openings result. To the unsystematic way in which the work has been conducted the explosions are in some measure to be indirectly connected.

It was customary to drive wide rooms to the rise, and such portions of the ribs were extracted as could be obtained before the roof collapsed, or showed signs of an approaching fall. The roof being of a hard siliceous nature, wide openings were thus left in the waste. No. 1 seam at chute 102 has approximately the following section.

THE BELLEVUE COAL BED

| | Ft. | In. |
|---|---|---|
| Hard Siliceous Sandstone | | |
| Coal | 1 | 4 |
| Siliceous Band | ... | ½ |
| Coal | 5 | 6 |
| Bone coal | ... | 1 |
| Coal | 2 | 1 |
| Soft Dirt | ... | 1 |
| Coal | 4 | 3 |
| Hard Floor | ... | ... |

It appears that in August, 1906, three ignitions were directly traceable to open lights, and then Wolf safety lamps were introduced throughout the mine. After this, no further ignition occurred until the series which are the subject of the paper, these being:

(1) Oct. 31, 1910, at 12 p.m. No one underground at the time.

(2) Dec. 9, 1910, at 7 p.m.; 37 men killed; 47 men in the mine at the time.

(3) About Jan. 28, 1911. No one underground at the time.

### Sparks Resulting from Dislodged Roof Rock

An experiment was tried in the mine with the hard siliceous roof which Mine Inspector Heathcote had suggested might cause sparks sufficiently intense to ignite firedamp. A large lump of the rock, weighing some 60 or 70 lb., was lifted and dropped into one of the chutes, on the floor of which lay some of the fallen roof. As the lump rolled down the chute, a brilliant display of sparks was observed.

When a specimen of this roof rock is struck a glancing blow with a hammer, the surface of percussion glows red hot for an instant. The rock contains bituminous matter and the heat generated by friction between the steel and the sand grains is probably augmented by the heat of ignition of the powdered bitumen or of the gas liberated.

When two small pieces of the stone are struck one against the other, sparks are seen, the intensity of the sparks varying with the energy applied. To obtain a continuous scintillation, a steel flint-mill was used. Sparking was produced of sufficient intensity to ignite coal gas or methane readily.

A further series of experiments was then tried, in which the rock was attached to a spindle capable of revolving at 200 or 300 r.p.m. When another piece of the rock came into contact with the revolving piece, sparks of sufficient intensity could be produced to ignite coal gas.

### Rock under the Microscope

We are much indebted to Frank Raw for a microscopic examination of this rock, and for the photographs of the microscope sections in Figs. 2 and 3.

The rock is a bituminous sandstone, very fine and even in texture, but clearly made up of distinct black and gray grains, giving the whole a dark gray color. Indistinct, though unquestionable, laminated thin layers of black occur in it and along these it splits most readily. A hand specimen roasted in a clear gas flame for some minutes yielded on one side patches of glossy black coke, while on the other side the black color had been discharged, doubtless through oxidation, leaving a pale-gray and fine-textured sandstone.

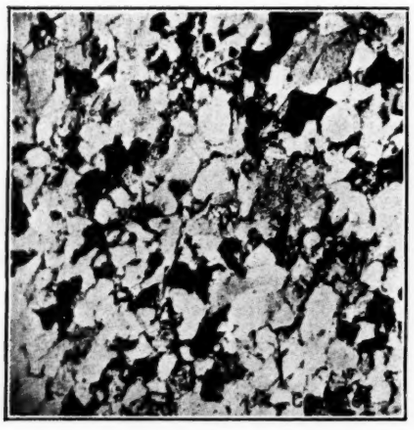


FIG. 2. A MICROSCOPIC SECTION OF ROOF ROCK FROM BELLEVUE MINE MAGNIFIED 40 DIAMETERS

FIG. 3. SAME MAGNIFIED 180 DIAMETERS SHOWING A CONGLOMERATE OF SANDSTONE AND BITUMEN

### A Siliceous Rock with Bituminous Cement

A thin section of the rock under the microscope shows a fairly even-grained texture, and consists chiefly of colorless grains, which are mixed with a large proportion of various shades of dull yellow and brown to black. The colorless grains are chiefly quartz, which comprises about 50 per cent. of the rock, together with a few feldspar granules and abundant grains of micro-crystalline rocks, mostly felsite.

The lightest-colored grains are also of micro-crystalline rocks, but the bulk of the brown grains, perhaps a sixth of the rock mass, seems to be of carbonaceous materials which exert no action upon

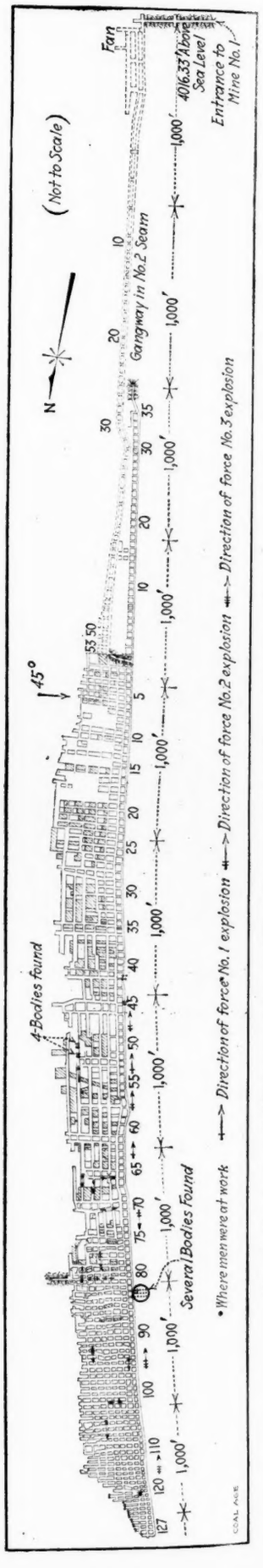



FIG. 4. PLAN OF THE WORKINGS IN NO. 1 BED BELLEVUE NO. 1 MINE, ALBERTA, CANADA, WITH GANGWAY IN NO. 2 BED. EXPLOSION BELIEVED TO HAVE BEEN CAUSED BY THE FRICTION OF FALLING ROCK

polarized light. Some of them show traces of organic structure.

The blackest grains (brown in reflected light), small and irregular in shape, which form strings along the bedding planes between the other constituents, are doubtless bitumen, and have clearly yielded under pressure.

Besides these definite areas of "bitumen," the grains throughout the rock are defined and separated one from the other by brown lines, which are most probably due to a bituminous cement, which fills all interstices, and thus renders the rock very strong. It is not improbable that the marked flame-producing property of the rock may be due in part to this perfect cementation, which limits the frictional heat to the surface.

### Ethane May Have Aided the Explosion

Several samples of mine air were taken which, on analysis, showed the presence of firedamp. One sample, for the analysis of which we are indebted to Doctor Wheeler, showed the presence of ethane, and the results of the analysis are:

THE GAS AT BELLEVUE

| | Per cent. |
|---|---|
| Carbon dioxide ($CO_2$) | 0.15 |
| Oxygen ($O_2$) | 19.30 |
| Methane ($CH_4$) | 4.35 |
| Ethane ($C_2H_6$) | 0.30 |
| Nitrogen ($N_2$) | 95.90 |
| Total | 100.00 |

It is of interest to note the presence of ethane in the above sample. As the ignition temperature of the paraffin hydrocarbons appears to fall slightly as the series ascends, the presence of this higher hydrocarbon on the firedamp would lower the temperature of ignition, and thus render more easy the ignition of gaseous mixtures by sparks from falls of roof.

It is clear, however, that sparks of sufficient intensity to ignite methane can be produced by rubbing together pieces of the roof of No. 1 bed. Methane has an ignition temperature—according to Dixon & Coward—of from 1032.8 to 1292 deg. F., and as other hydrocarbons have been shown to be present, the temperature of ignition will be less, and an explosive mixture will be more readily ignited.

### The Cure for Such Explosions

By the abrasion of two surfaces of the rock in question, it appears that a definite amount of energy has to be expended before sparks of sufficient intensity can be produced to bring about ignition. We are satisfied, however, that we have established the fact that sparks can be produced by falls of roof in the No. 1 Bellevue seam sufficient to bring about the ignition of inflammable gas; and as subsequent examinations after each explosion showed that falls did occur, in which large masses of the roof fell, in areas where, in all probability, gas was present, it seems perfectly clear that the cause of the three explosions at Bellevue have been satisfactorily explained.

To avoid such calamities in the future is a very difficult and serious problem. A form of working which permits of the filling of the goaf space, appears the most satisfactory solution, but such a method is connected with commercial questions which we have no intention to discuss.

It is well known that the origin of a number of explosions at collieries has remained obscure, and while it is not suggested that sparks from falling roofs are by any means common, it is a subject which deserves the serious attention of all employed in mining.

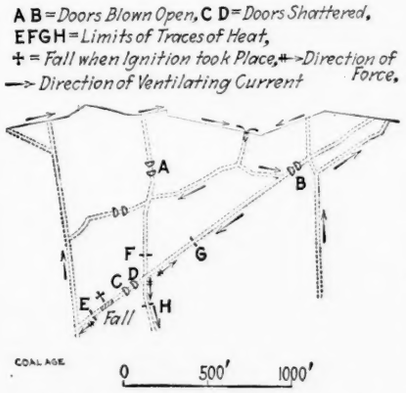



FIG. 6. PLAN OF WORKINGS AT THE MAINDY SHAFT

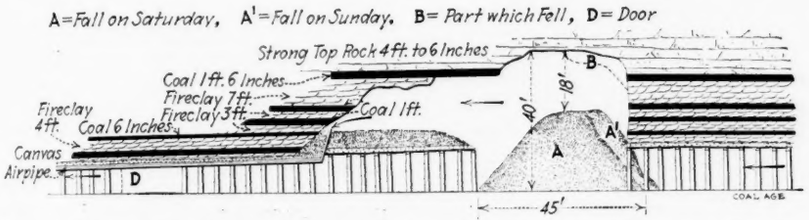



FIG. 5. SECTION THROUGH A FALL WHICH IGNITED THE GAS IN THE UPPER BED AT MAINDY SHAFT WORKINGS, GLAMORGANSHIRE, WALES

## Mining Examinations

Examinations for mine foremen and hoisting engineers have been held by the state mining board of Iowa, as follows: May 7 and 8, at Centerville; June 11 and 12, at Des Moines; Aug. 27 and 28, at Des Moines; Sept. 17 and 18, at Albia.

In Wyoming, the Examining Board has held mine foremen and fireboss examinations Sept. 18-20, at Hanna, Wyo.

## Rocky Mountain Coal Institute

The effort to organize a "Western Coal Mining Institute," to comprise the states of Colorado, Wyoming, Utah and New Mexico, is meeting with astonishing success. Of all the men who have been approached on the subject not one has replied in the negative. Encouragement is met at every hand and offers of kindly assistance have come in by the score.

The coal industry in practically every state is taking on a new lease of life. Prices generally are much better than in recent years, and coal operators are putting themselves in a position where they can carry out long-cherished plans for the improvement of both property and men.

No little of this material betterment is directly attributable to the "get-together" spirit which now pervades the industry. Every man from the coal-company president to the miner at the face, is being benefited by the improved conditions.

In our issue next week we will publish the names of the temporary committee appointed to perfect arrangements and issue the call for the first meeting of the "Rocky Mountain Coal Institute." Every reader of COAL AGE in the states affected, and who has not already signified his willingness to become a charter member of the new institute, is again requested to send us his name and address, which will be turned over to the committee, thus simplifying and furthering the work of the organizers.

## Rescue Apparatus Now Widely Used

It is interesting to note the rapid advances recently made in the use of oxygen breathing apparatus. The Draeger people estimate that up to December, 1911, their type of rescue outfit was distributed as follows: Germany, 2469; Austria, 706; France, 112; Russia, 253; Belgium, 194; England, 261; United States, 988. Adding those installed during the present year, brings the total up to about 6000, of which number more than 1200 are installed in the United States. There were 15 Draeger apparatus brought to this country in 1907, these being the first of this type ever installed in America. In view of the fact that the Draeger apparatus was first manufactured in 1904, it is evident that the record of the company is most excellent.

Experience has shown that, to a large extent, the safety of workmen and the efficiency of the mine management depends upon the length of term of office of the mine officials. No advantage can be gained by a frequent change of the personnel of a mine.

## Trouble with an Electric Fan

FOREIGN CORRESPONDENCE

In view of the increasing use of small auxiliary fans for district ventilation in collieries, it may be interesting to refer briefly to a practical difficulty which occurred in connection with an electrically driven fan, in order to show what care is necessary in maintaining all parts of the electrical equipment in a proper condition.

It is, of course. essential that the ventilating arrangements of a mine should be as reliable as possible and hence any known sources of trouble should be subjected to periodic examination, in order that any incipient difficulty may be removed before it becomes serious. Hence a previously acquired knowledge of the vulnerable portions of any equipment is of considerable value to the colliery electrician.

### AN ACTUAL OCCURRENCE

In one instance a motor direct-connected to a fan was controlled through a regulator fixed in the circuit. By this means the speed of the motor could be governed throughout a wide range, and hence a considerable variation secured in the amount of air delivered by the fan. At the time that the incident to be mentioned occurred, the fan had been working for an extended period on its lowest speed, delivering only a limited amount of air, no signs of heating being apparent.

When finishing the shift the motor happened to stop a few minutes before the time it should have done so, and the trouble was not taken to start it up again. When, however, it was attempted to operate this machine on the succeeding Monday morning it failed without any apparent reason to respond and a close examination was made both of the motor itself and of the circuits and fuses controlling it.

Nothing could be discovered by inspection and a lamp was therefore put in series, first through the starter and then through the speed regulator. When this had been done it was discovered that the trouble was in the latter. It was therefore disconnected and the cables joined direct.

The motor was in this way run at full speed while ventilation was required, and in the meantime the regulator was taken apart for examination and repair. It was found that one of the coils of the resistance had apparently heated, possibly owing to insufficient contact, eventually melting the solder, and disconnecting one of the coil leads.

The use of solder for these regulating resistances is hardly to be recommended, but if solder must be employed, the utmost heating limit which should be allowed is about 200 deg. F. Otherwise there is danger of fusion taking place. In this particular instance the solder connection was done away with and replaced by one fitted with substantial set screws, giving a firm mechanical contact.

This incident, although perhaps trivial, points out a possible danger which may be averted by frequent inspections. It is submitted therefore in the hope that it may be helpful to some one engaged in colliery work.

## Coal at Panama

BY F. C. CORNET*

In July or August, 1903, I called attention, in the *Engineering and Mining Journal,* to some coal deposits situated on the Isthmus of Panama. I think the matter has never been mentioned since. Nearly every day we read of the Canal and the doings there; but I have not yet been able to discover, in all I have read, any reference to that coal. One outcropping of the seam, which I saw a good many times previous to 1896, is in a place where it could not have escaped attention during all these years.

The outcrop was on a so called ranch, owned by a Frenchman who was well known in those days, by everybody on the Isthmus. This man, M. Jean Gris, was the proprietor of the Inter-Oceanic Hotel, which was destroyed by the Colon fire of 1895 or '96. It was in this hotel where I first saw the coal on exhibition. I visited the ranch a good many times, during the two or three years I lived on the Isthmus. It was situated near the Canal and railroad lines, only a short distance from Panama. It was, however, a good hour's walk from the Panama railroad station, at Frijoles, although the distance was less than two miles. There were scarcely any roads, and the heavy undergrowth made progress very slow.

I have not been on the Isthmus since 1896; but gather from all I have read, that the waters of the Gatun Lake are now deep over the site where Frijoles was located. The edge of the lake must be less than two miles from the ranch, which is certainly still high and dry and must remain so at all stages of the lake, because of its altitude. The new railroad runs, I believe, on the left bank of the lake, going toward Panama, and must pass within a short distance of the ranch, if not actually through it. The proximity of this coal to both lake and railroad, and the fact that there is no other coal nearer than the states, should make the deposit one of great importance, if the coal is at all workable.

The ranch was well within the Canal Zone, and the French Panama Co. raised a question as to M. Gris's rights to the place; but I believe the old Frenchman was able to prove a good title to the property. The place was called the "Mine," by those who knew that there was a mine there; though it possessed no commercial importance. The caretaker on the place used to dig coal there. The ranch was a rendezvous where M. Gris used to entertain his huntsman friends, for weeks at a time, each dry season. The coal provided by the caretaker was used then for cooking purposes, as also for keeping immense fires burning around the place to drive away the mosquitoes and hold wild beasts at bay during the night.

### FIND THE MINE

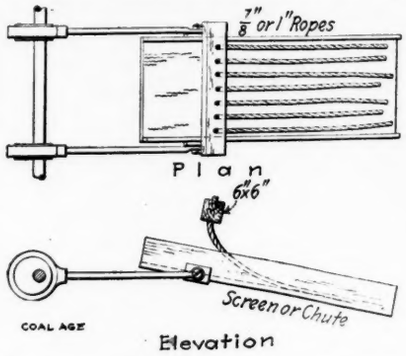
The above statement contains about all I remember of this coal deposit. But it is sufficiently plain to enable anyone who cares to go down there, to find the "Mine." I think the matter is worth investigating in view of the large steam traffic that is expected to pass through the Canal. Labor will soon be plentiful. The thousands of Jamaica negroes now employed on the Canal could be taught to dig coal. I know enough of those Jamaica blacks to guarantee that they would make pretty fair coal miners.

*Mining Engineer, Charleston, W. Va.

## Retarding Coal on Shaking Screens

BY BENEDICT SHUBERT*

It is often desirable to retard the flow of coal on shaking screens or on gravity screens in order to permit a better screening. This can be done easily by arranging lengths of wire rope, as shown in the sketch. The rope is cut in approximately 10-ft. lengths and is securely anchored to a 6x6-in. timber set above the screens, the ropes being spaced about 4 to 6 in. apart. These ropes tangle up in the coal and form a very efficient retarder. Any old length of 1-in. or ⅞-in. rope can be used.




DEVICE FOR RETARDING COAL ON SHAKING SCREENS

As the coal flows at different speeds at different times, the flow can be quickened by hanging up every other length of rope.

This method works better than buffers or gates and causes absolutely no breakage to the coal.

*Boston Building, Denver, Colo.

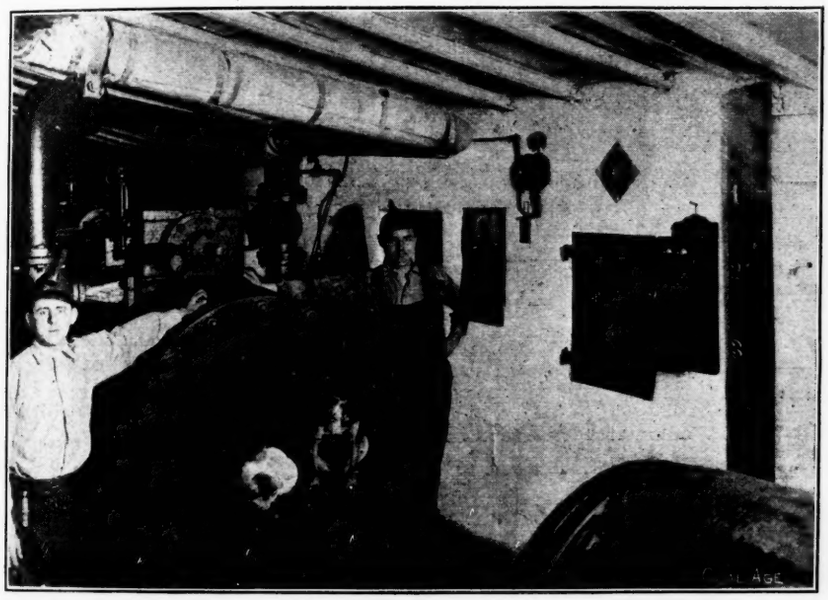
## Near the Foot of the Shaft

By Edward Trounson*

If you were to casually suggest to an outsider a visit to an underground pump house, the chances are that he would not jump at the chance. In fact, even if your friend were a mining man, he might put you off with the remark that all pump houses are alike.

Are they? In one respect, yes. They all have pumping machinery installed in them and an attendant to operate it. In general appearance, cleanliness and arrangement, however, they are as different as night and day.

The accompanying illustration is a photograph of a pump house in an anthracite mine near Mt. Carmel, Penn. This building was constructed by taking a skip 14 ft. wide and 50 ft. long off from the gangway. The outside wall was then built of concrete and whitewashed.



Interior of Pump House Showing Towser and Rags, Boon Companions, and Mascots of the Mine

The inside, however, is what interests us. The roof is supported by discarded rails, which rest on the concrete and run across the room into the inside wall. The water indicator is seen on the extreme right, and is connected to a float in the sump.

The telephone represents the connecting link between the caverns of the mine and the outer world. To the left of the phone is the black door of a cupboard for memoranda, etc. The importance of having the pressure gage, indicator and clock all near the telephone is realized by the man who has to crane his neck to see them when he is using the instrument.

One little touch which shows that the miner has an abundance of the human quality we sometimes call personal pride, is the presence of the hand-mirror below the pressure gage.

Then, too, there are Towser and Rags, the mascots of the mine. Many a lonely vigil have they kept, and so well have they done their duty, that not a rat can be found in the vicinity of the pump house.

The cat was born here two years ago and has never seen the light of day. She knows no other world than the mine, but she has a faithful friend and guardian in the dog.

*39 S. Oak St., Mt. Carmel, Penn.

## Notice

### The Lehigh Coal and Navigation Co's Position in the Panther Creek Valley Labor Trouble

That the company's position in regard to the present strike of its employees in the Panther Creek Valley may be thoroughly understood and to refute the mistatements which are being circulated in regard to its position, we would state that the company has in every particular maintained absolutely the terms prescribed in the agreement with the miners. Article 9 of the award of the Anthracite Coal Strike Commission which was reaffirmed and continued by agreement of May 20, 1912, states as follows:

"The commission adjudges and awards: That no person shall be refused employment, or in any way discriminated against on account of membership or nonmembership in any labor organization; and that there shall be no discrimination against, or interference with any employee who is not a member of any labor union by members of such organization."

### Strike Violates Contract

A careful reading of this clause shows that every so called button strike or refusal by the men to work at any colliery because some of the employees of that colliery do not belong to the union, is a direct violation of this part of the contract.

The company, although annoyed and put to considerable expense by these button strikes which have been called at one mine after another throughout the valley has taken no part but has remained absolutely neutral, not interfering with any of the efforts made by the union to increase its membership.

In the case of the two Miller brothers at Nesquehoning, which seems to be the basis of the present strike, it is not true that the resignations were refused by the company. It is true that when the union officials advised the company that violence might be shown to these men on account of the bitter feeling evinced by some of the men against them for their continued refusal to join the union, the company ordered its coal and iron policemen to maintain order and to see that no violence was done to them, giving them the protection to which they were entitled. The same protection would have been given to union men.

While the company is losing the advantage of a good market and working conditions it is, however, conserving its coal and will be able, therefore, to make up its losses in the future. The loss to the employees of $20,000 a day in wages which they would otherwise receive from the company cannot be made up and this loss will be felt throughout the winter, not only by them, but also by the merchants and businessmen of the Panther Creek Valley who are dependent upon the wages of the employees of the company for their business success.

### The Company Only Desires a Recognition of the Agreement

The situation seems to be an unfortunate one, but the only suggestion thus far which has been made by any union leader was the impossible proposition that the company should violate its contract by discharging men for not joining the union.

The company's position is that they will live up to Article 9 of the strike agreement and will not discriminate in any way for or against, any employee for being a member or not a member of a labor organization and the company demands that the United Mine Workers of America show their good faith by ordering the men back to work.

In case of any dispute regarding this or any other matter, the company stands ready to submit to the decision of the Board of Conciliation.

"No suspension of work shall take place by lock-out or strike pending the adjudication of any matter so taken up for adjustment."

(Signed) Edwin Ludlow,
Vice-President.

# Current Coal Literature

**The Best Thought Culled from Contemporary Technical Journals, Domestic and Foreign**

## Powder Magazine and Thaw House

After an investigation of the methods of storing and handling explosives, the U. S. Bureau of Mines decided that cement-mortar construction was best for magazines and thaw houses. The houses shown in the accompanying engravings were built by the Bureau of Mines and are described in *Technical Paper* 18, written by Clarence Hall and Spencer P. Howell.

### The Magazine

The cement-mortar magazine has a capacity of 20,000 to 30,000 lb. of explosives and was built at a cost of $400. The outside dimensions are 10x14 ft. The salient features of the magazine are the cement-mortar walls, sliding door and roof.

The cement mortar is 6 in. thick in all walls and 3 in. thick in the roof and the door. The door is secured by two substantial locks. No metal of any kind is exposed on the inside of the magazine. The ventilators above the floor are arranged to prevent the entrance of bullets or firebrands.

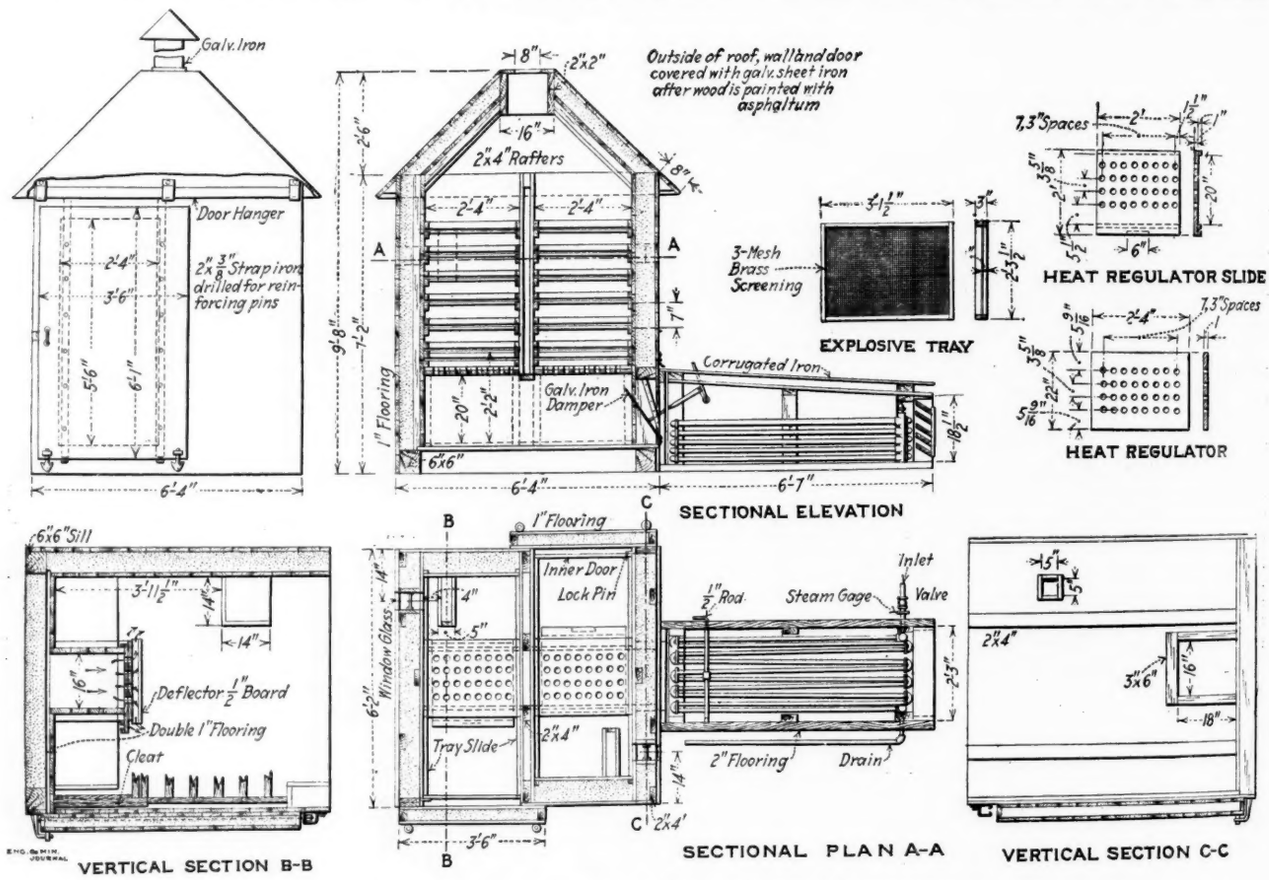
The means provided for ventilation were found to be adequate, therefore the storage conditions are favorable for keeping the explosives from deteriorating. The cement-mortar construction is effective in resisting the penetration of rifle bullets, and because of its friable nature offers an additional advantage for the reason that, in the event of an explosion in or near the magazine, large masses of material will not be projected over the surrounding country.

The galvanized-iron covering is fire-resisting; it also serves as an excellent medium for protection against lightning, as the four corners of the building are properly grounded with metal rods. The concrete of the foundation consists of one part cement, three parts sand and five parts gravel. The cement mortar in the walls, door and roof consists of one part cement to six parts coarse sand.

### The Thaw House

The cement-mortar thaw house built by the Bureau of Mines for thawing large quantities of explosives has a capacity of 500 lb. and cost complete $200. Entrance is difficult and not necessary, for the trays can be entirely removed without entering the house; all parts of the house are accessible for cleaning; the explosives can be distributed in thin layers in the trays; the thermometers are easily read from outside.

The thaw house also has the following advantages in regard to temperature: the low-pressure steam, the hot-water or electric coils used for heating are not in the thaw house proper but in a separate compartment at its side, and hence particles of explosives cannot come in contact with them; the explosives are not subjected to the evil effects of free steam or water; the temperature is surely and easily con-




BUREAU OF MINES THAW HOUSE OF CEMENT-MORTAR CONSTRUCTION

trolled with little attention; the entrance of cool air or the escape of heat from the thaw house is reduced to a minimum; the stack makes possible the positive circulation of heated air.

### Hot Air is Made to Circulate in the Compartments

The position of the heating box with reference to the explosives compartments, its slanting roof and stack make a natural draft easy. The cold air from without is drawn through the air regulator, over the hot coils, through the damper opening, into the air conduit.

Thence it is passed upward through the holes in the compartment regulators and through them only. The air is then deflected to each side of each compartment by means of deflector boards, one of which is directly above each compartment regulator. As the trays in each compartment are staggered, the air is deflected backward and forward as it rises, until it finally escapes through the stack.

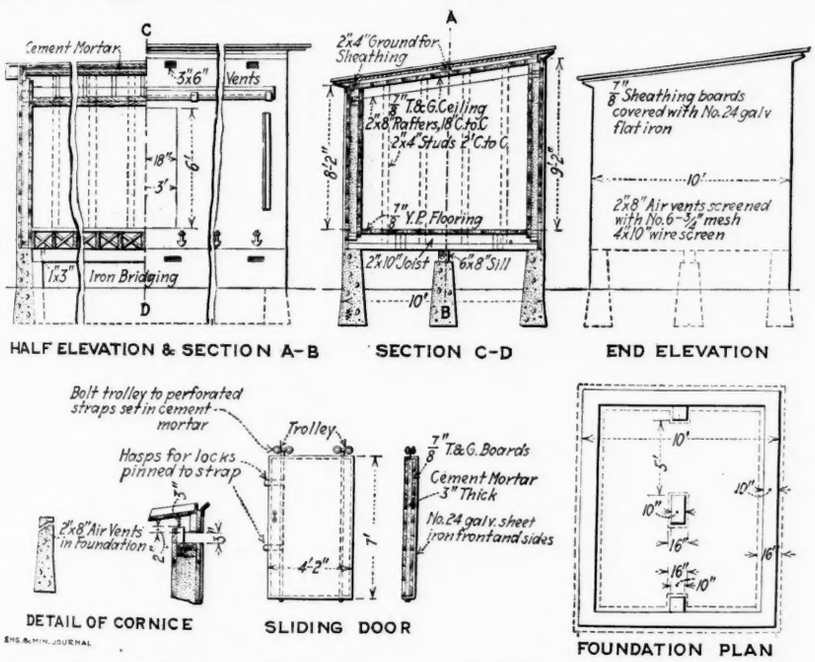
The air regulator consists of five adjustable ¾-in. louver boards, spaced 3 in. apart. This regulator is used only to control the quantity of air passing over the coils. If the outside air is very cold, the circulation is reduced by partly closing the louver boards, in order that the air entering the explosive compartments may be heated to the proper temperature.

On the other hand, when the outside temperature is comparatively high, say 32° F., the louver boards are left completely open, or nearly so, in order that the air entering the explosives compartments may not become too warm for the safe thawing of explosives. A damper is included in the construction as a precautionary device for instantly cutting off the heating box from the air conduit and the explosives compartments.

### Each Compartment Can be Heated Separately

Each compartment regulator consists of two 1-in. boards, the upper one stationary, the lower one sliding. Each board has thirty-two 1½-in. holes, the holes in the movable board coinciding with those in the upper board. Each explosives compartment may then be supplied with equal quantities of air by partly closing the holes of the regulator for that compartment.

Either section may be completely isolated from the incoming warm air by closing its air regulator, and hence one compartment may be used without the necessity of heating the other, or the sections may be used alternately. The steam coils consist of 50 lengths of 1-in. pipe, each 5 ft. 2 in. long.




Powder Magazine Recommended by U. S. Bureau of Mines

The galvanized-iron covering of the thaw house is grounded in the same manner as that of the powder magazine, and thus protection is provided against lightning.

## Breathing Apparatus in Rhine-Westphalia District

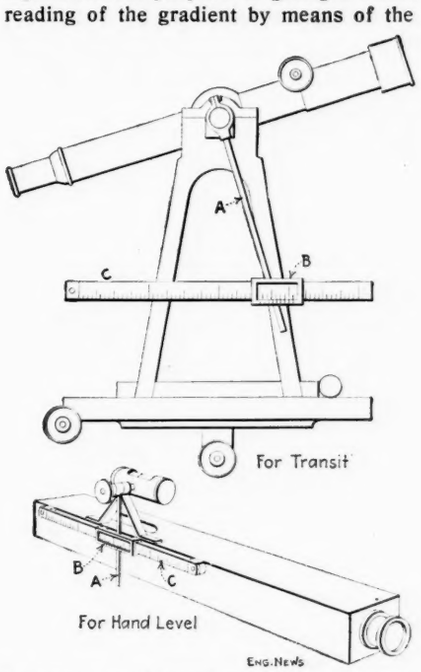
*The Rhein-Westfalien Zeitschrift* on Aug. 29 made the following statement relative to breathing apparatus:

"After a thorough investigation of the use of rescue apparatus and trained crews in the mines of the Rhine-Westphalia District as provided for by Section 242 of the mine regulations of May 1, 1912, it was found that there are at present in use 847 sets of portable rescue apparatus.

Of this number, 449 are of the Westfalia type, 381 are of the Draeger type and 17 of the Westfalia-Shamrock. There are 841 hose apparatus of which 254 are of the bellows type and 587 are of the air-pump type with helmet or mask. There are 121,948 ft. of hose, 230 reviving apparatus of which 95 are for artificial respiration and 135 for inhalation only, 1515 electric lamps and 4036 well trained men for rescue work. Mines in this district employ about 150,575 men. There is probably no other mining district in which rescue apparatus and trained crews are so well established."

## Gradient-Reading Attachment for Transits and Levels

The transit attachment illustrated in the accompanying sketch was patented by F. W. Austin, Hartford, Iowa, in 1909, states *Engineering News*. It was designed for the purpose of giving a direct reading of the gradient by means of the inclination of the telescope. In this design, a rod *A* is attached to the telescope trunnion and extending below it passes through a sleeve on the back of a vernier *B*, causing this to slide along a fixed horizontal scale *C* as the telescope is oscillated on its bearings.




Transit and Hand-Level Fitted with Grade-Reading Attachment

The device is also applied in the patent to a hand level. In this case (which also is shown in the cut) the scale is attached to the side of the telescope, with space enough between them to permit the radial movement of the rod, the upper end of which is attached to the trunnion of the spirit level. When the telescope is tilted and the spirit level is maintained horizontal, the movement of the rod relative to the telescope shifts the sliding vernier along the scale and registers the inclination of the line of sight. This vernier is graduated in feet and tenths.

# Who's Who—in Coal Mining

**Devoted to Brief Sketches of Prominent Men, Their Work and Ideas**

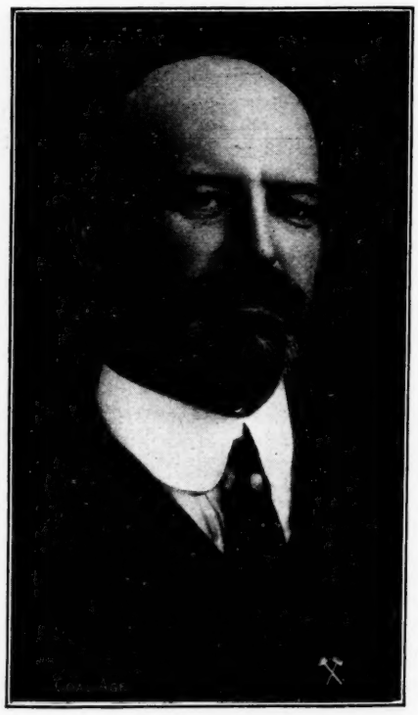
In meeting the intricate coal-mining problems of northeastern Pennsylvania, a number of highly proficient engineers have been developed. None of those now engaged in active work is the peer of R. V. Norris, of Wilkes-Barre, when it comes to the technique of the science.

Mr. Norris was born in Newark, N. J., May 2, 1864, and received his early education in the Collegiate School of New York City, later securing the degree E.M. from the Columbia School of Mines. After graduating from the latter institution in 1885, he accepted a position as assistant instructor in mining and surveying at the School of Mines of this same university, serving in this capacity during the summer term. Following this work, he was engaged for a short term as inspector of dredging for the United States Government, and later was in the Federal employ as chemist.

In June, 1886, R. V. Norris was made an assistant engineer of coal mines for the Pennsylvania Railroad Co. This work included mine surveying and drafting and occupied his time and attention until 1893, when he was promoted to be principal assistant engineer for the same company. In 1900 he was advanced to the position of chief engineer, in which capacity he served until 1904, when he was again advanced and made consulting engineer for all the coal mines of the Pennsylvania interests. He still serves as consulting engineer for these same people.

In addition to the work last mentioned, Mr. Norris entered private practice in 1904, and since that time has been employed in a professional way by many of the larger anthracite companies. At present he is consulting mining engineer of the Delaware, Lackawanna & Western Railroad Co., having been appointed to this work in 1907. For the past six years he has held the position of lecturer on coal mining at Harvard University, having begun with a few lectures and now giving the regular course in coal mining. He has also served as a graduate lecturer at Columbia College in New York at irregular intervals for a good many years.

Mr. Norris was married June 7, 1893, to Esther W. Shoemaker, of Wilkes-Barre, and has three children, R. V. Norris, Jr., in the class of 1915, Sheffield Scientific School, Yale University, Jane Norris, at Westover School, Middlebury, Conn., and Esther Norris at home. "R. V.," Jr., is studying mining engineering, and expects to make that his future profession.



R. V. NORRIS

Mr. Norris has devoted a large part of his time in recent years to the design and construction of numerous storage plants, which work was described in a paper entitled "Storage of Anthracite Coal" and read before the Wilkes-Barre meeting of the American Institute of Mining Engineers, June, 1911.

Another piece of difficult work handled by Mr. Norris was the building of a terminal for the Wilkes-Barre & Hazleton R.R., of which company he is consulting engineer. This job included the construction of a steel viaduct, about 1200 ft. long and extending into the city of Wilkes-Barre. The sinking of the Woodward No. 3 shaft, which was fully described in the *Engineering and Mining Journal*, June 4, 1910, was an engineering feat of much importance and was carried on under his direct supervision.

Few men in the anthracite field have been called upon to act as technical expert more often than has R. V. Norris. He furnished much of the data submitted by all the hard-coal companies in the tax-valuation proceedings in Lackawanna, Luzerne and Wayne Counties of Pennsylvania. This work involved the examination and valuation of practically the whole of the northern anthracite region. He was also employed as technical expert for the coal companies in the so-called anti-trust suit of the United States Government vs. the Reading Co., *et al.*

He has been appointed arbitrator in many anthracite disputes between different coal companies, as well as between coal companies and individuals. Much of his work has consisted in acting as expert in the technical litigation connected with the anthracite business, particularly the royalty litigation, which is constant and extremely difficult.

In his consulting capacity, R. V. Norris was among the pioneers in the use of compressed-air haulage, having put in the first underground high-pressure plant in the anthracite region. He was also one of the earliest engineers to advocate the use of steel props underground, and to employ the same material in the construction of headframes. His method of using "steel mine timbers" was described in the *Engineering and Mining Journal*, July 14, 1904.

In 1886, Mr. Norris constructed what was probably the first engine foundation built of concrete in the anthracite field, using, for this purpose, imported cement. He also radically changed the practice in hoisting in hard-coal mines by introducing the use of the piston valve in "winding" engines, instead of the old slide valve, and was one of the earliest to use power brakes and reverse.

His efforts have been largely in the direction of the conservation of our coal resources, by working toward improvements in mining and preparation. His aim has been to perfect methods whereby a larger percentage of the coal in the ground will finally reach the market. This, he says, can only be accomplished by leaving greater support in first mining, and by filling and flushing before second mining. His idea is that more complete second mining will be possible after better support has been provided.

One other phase of coal production which has a direct bearing on conservation is improved methods of breaker practice, designed to minimize breakage, not only at the collieries, but in transportation and in the wholesale and retail handling of fuel.

R. V. Norris is a member of the American Institute of Mining Engineers, American Society of Mechanical Engineers, American Society of Civil Engineers, Institution of Mining Engineers of Great Britain, Canadian Mining Institute, and at present is one of the vice-presidents of the council of the A. I. M. E.

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*This journal is interested solely in matters relating to the fuel industries, and is designed to be a medium for the free interchange of ideas, the detailed description of coal-mining practice, and the expression of independent thought calculated to benefit both operator and miner.*

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# COAL AGE

## The Farmer

Much of the sociology of the past has been sheer emotionalism, not a science but a sentiment. It is well that we now move out into the clearer air. It was necessary that we should draw crude inferences where facts were not available and our pathetic gropings after truth were excusable because until just recently sociological data were not to be obtained. Our feelings are now relegated to the rear and we become dominated by solid facts.

It is somewhat startling to learn that in Germany in 1908 the agricultural and horticultural industries combined caused 43½ per cent. of those accidents which incapacitated the workers for more than 13 weeks, and that 45 per cent. of the partial permanent occupational disability was caused by agriculture and horticulture.

In an editorial, the "Value of a Life" we recently commented on the fact that there were risks in all occupations and that even farming was not exempt. We wondered then whether a bare statement of that kind would carry any large degree of conviction without statistics to back it.

The broad class termed agricultural and horticultural in Germany includes those working at forestry and stock raising, yet only 37 per cent. of all occupied males are so engaged. So it is clear that "the farmer class" has an abnormal accident rate, though the percentage of its mortalities to all mortalities of occupied males is only 30½ per cent.

And what is it kills and injures the farmer? Strange to say, his worst enemy is himself. First and foremost among the causes of death are "falls from ladders" which injure 98.78 men in 100,000 and next come "teaming" with an accident rate of 64.17 and "animals" with a rating of 53.28.

There is an analogy in mining. The miner is his own worst enemy. Let us not blame him, for we confess that we all need a league to defend us against ourselves. Our employers can in part protect us, but our own carelessness is the worst affliction we have to face and no employer can protect us against this. Let us strip from our eyes the cataract of our neuroticism and endeavor to assure our lives by a due measure of precaution.

## Lakeside Park Meet

We were entirely unprepared to see such excellent work as was performed by the first-aid teams at Lakeside Park on the 21st of last month. It would be only fitting to term it "marvelous" but we hesitate to "stale with ordinary oaths" the language of our editorials for fear that those who did not see the work may feel that we regard marvels as of frequent occurrence and lest they should fail, despite our praise, to give the credit rightly due such excellent work.

The illustrations we showed in last week's issue gave no adequate idea of the perfection of the bandaging or of the care, the skill and the patience of the men who performed it.

We found it hard to believe that hands swollen from toil, corded with sinews and cut by fragments of coal had by patience and diligent application done bandaging passing the art of a surgeon or nurse.

The anthracite miners, especially those near Pottsville, are almost all of native birth and their interest in first-aid work is only to be stimulated by giving them difficult problems. They would soon weary of the trivial round of simple bandaging.

Sometimes it seemed, however, that the interest centered too fixedly in the difficult arts: the making of spica bandages as elaborate as those which swathe an ear of barley and the deft manipulation of figures of eight, protecting the ligaments of a knee. There are simpler expedients than these which every woman knows by instinct but which must be learned by men if they would do a nurse's work in places where women never go.

We saw some patients rest on one arm during the whole period of bandaging. In

a real case of injury, this would not occur. Before long, the spell of faintness and dizziness would make support necessary, but meantime the patient would fall.

It should be remembered that someone must nurse the patient while bandaging proceeds. If the victim is sitting, he should not have to rest on his arm. If one leg is being dressed, the other should be supported. If he is faint, someone should fan his head. There were always men enough to minister in this manner to the subjects who were being treated, but curiosity had the upper hand and the ministrant was transformed into a spectator, as too often happens after an actual accident.

They say the first-aid men are kinder and more considerate to their patients than any doctors, that years of acquaintance with pain and grief have not taken toll of their human sympathies. Nevertheless, unless they are taught they will not learn those little arts of ministry which do not appeal as a science perhaps, but are none the less, primary duties of the first-aid worker.

There are many who oppose teaching elaborate bandaging work to any kind of industrial workers. The assumption is that it requires a doctor's skill and extended training to do such work. There is no disposition on our part to answer this question, but it is well never to forget that years of democracy have taught that almost any man can do, within average human limits, such acts as he is assured repeatedly, lie within his powers. The right and duty to act and the stimulus of approval give new viewpoints and added force to the slumbering intellect.

Nevertheless, the subject is larger than one of personality and skill. The mine is an undesirable place in which to do elaborate work. Uncertain illumination, a degree of insanitariness, inefficient appliances, first-aid workers covered with the impurities of their trade, cold and discomfort, lack of water if not of medicaments make intricate applications in large degree inadvisable.

It is well that the Bureau of Mines called together the first-aid conference which met on the 23d and 24th of last month, though we do not expect that the two schools of thought will ever get together except to disagree. It is not that we wish to see a wrangle but we have observed how variant opinion stimulates thought and emphasizes any matter which may be in question.

We hope that this discussion will bring so worthy a matter as first aid prominently before the public. We trust that it will receive more than the passing sneer of a somewhat sceptical profession. In the outcome, first-aid work must benefit by the disagreement.

The practice of having intra-company meets, customary in the anthracite region, prevents an uncertainty in rating the performances of the contestants, because there is less difference of view between the physicians engaged by any single company and a knowledge of the probable character of judgment likely to be rendered by the examining physician or first-aid authority on any class of work.

But in most other regions, inter-company meets are necessary, owing to the small size of the operating corporations. When the teams from these various companies meet in competition, rules to direct the judges are essential. In baseball "three strikes is out." It would be equally permissible if thirteen instead of three strikes retired the batter, but a rule has to be made, not by an individual umpire but by a body of convened experts.

For instance, the doctors as umpires should not decide their personal preferences as to the Sylvester or Prone methods by mulcting the score of the team which has been trained by a doctor of an alien school. Yet we conceive cases could be specified where the Sylvester method should be entirely ruled out as liable to intensify all or a part of the injuries from which the patient is suffering.

It is true that first aid is not a game, yet nevertheless the meets must be regulated as such, if fairness is to be assured. Nothing must be left to individual judgment, for personal choice will destroy the meets and in their destruction, first aid will receive a body blow.

All that is required is that the rules adopted shall be based on scientific principles and shall enunciate clearly the necessary actions of first-aid men in certain eventualities, the methods of procedure being determined by a consensus of opinion of the medical profession in mining fields.

The need is the greater because at every meet there are several judges of varying views, unequal severity and differing powers of observation. All these difficulties, even the latter in a degree, will be removed by a code of rules. The matter was met at Lakeside by having but one judge. The consequence was that the decisions were rendered almost wholly on the final result and not on the manner by which it was attained.

Whether the patient was lifted by a jerking action, whether he was held awkwardly and under strain, could make but little difference to the result in the end if only the bandages held firm, were properly placed and otherwise stood inspection. Here the test was thorough, the bandages being occasionally ripped, to ascertain whether the work was well done.

One of the differences between bituminous practice and that, we believe, of the whole anthracite region is to be found in the time limit set in the first and its absence in the second. One of the events at Lakeside Park took 25 minutes.

We confess we are not sorry to see the time limit removed or at least extended. It is far more important, wherever atmospheres are not vitiated by dangerous gases, to do a good job than a quick one. In fact, urging celerity has sometimes the worst possible effect. It makes those who contend in these events nervous and excited whenever engaged in bandaging. The misfortunes of the mines are best met by cool men, and first-aid exercises should, like fire drills, tend to quiet the well trained in the presence of danger and disaster.

---

A bill for the nationalization of the mines in the British Isles has been drafted and introduced into Parliament on behalf of the Miners' Federation. It is suggested that the present mine owners could be given government stock with a fixed dividend of about 3 per cent. in exchange for the value of the mines which they turn over. In this way the industry could be nationalized without the expenditure of much money. Another important provision is that empowering the government to work the mines without payment of royalty.

---

When a superintendent orders loose rock or coal taken down, or props set, he should insist upon its being done at once. He should have the work started while he is present, as a delay in carrying out such instructions often results in a serious accident.

# Discussion by Readers

**Comment, Criticism and Debate upon Previous Articles, and Letters from Practical Men**

## The Miner's Certificate Situation

I was much pleased to read, in one of the recent issues of COAL AGE, a short article from the pen of my friend McDermott, mine inspector, Helena, Mont., bearing on the general situation of the miner's certificate.

To a mine inspector, the situation is perplexing. I have no disposition to discuss it at length, at this time. It is a many sided question and its remedy is not easy. There are many individuals to be considered, and many interests that must be consulted and conserved; so that the real issue, the question of safe mining and the preservation of human life, is obscured and difficult of solution.

Of what purpose is it for a mine inspector to visit the working places in a mine, day after day, telling the same men the same thing and getting the same results, over and over again? What man can take an interest in his work when he finds himself up against a stone wall and unable to produce the results for which he strives? I do not wish, however, to dwell on this phase of the subject, as it is well understood; but the thought I would express is the following:

Speaking of the Pennsylvania mine law with which I am or was, until recently, most familiar, I would say, Let the mine certificate stand as it is written. Enact an additional law to operate in the following manner: When a miner applies to a mine foreman for a place, upon the strength of the certificate he presents, let the foreman give him a breast if he has a place open.

Later, when the mine inspector visits the mine, he should ask to be taken to the places of those men employed since his last visit, or request that these places be pointed out to him on his round. Upon going into a miner's place, the inspector has no need to ask a miner, "What would you do under such and such conditions."

The point that interests the inspector most is "What is this man doing under the conditions that surround him." That is the most important question. If the inspector has eyes, he can see for himself how the miner handles his roof, keeps his road, stands and caps his props, stores his powder, drives his crosscuts, and keeps up his brattice; and how, in general, he conducts himself and performs his work. From these observations, the inspector knows, or should know, the degree of competency of the miner, without asking a specified list of questions, all of which the miner may be able to answer, but few of which he puts in practice.

Now, I would suggest that if the inspector finds the miner a careful workman, he should, then and there, issue to him an inspector's certificate of competency or qualification. This certificate may be styled "Certificate A."

If, again, he is an exceptional miner and has been entrusted with the execution of special, extraordinary, or dangerous work; and has accomplished the same to the satisfaction of the mine inspector, I would suggest that the inspector issue or give him a higher-grade certificate of qualification. This certificate may be styled "Certificate B."

Should the miner show, to the satisfaction of the inspector, that he possesses a capacity for even greater responsibilities than those mentioned, a still higher grade of certificate may be issued. This may be styled "Certificate C."

Now, suppose, on another occasion, the inspector finds that a miner has indulged in carelessness, or has been guilty of an infraction of the rules, mine regulations, or laws, which may or may not have resulted in an accident, the inspector should at once reduce the qualification of this miner, according to the degree of his offense. If the miner holds Certificate A, the certificate should be revoked and the miner put on probation, as a laborer or company man, for six months or a year, as the case may demand. Should the miner leave the mine in which he was working, he can only receive a probation card, which is all he will have to present to his next employer.

I have given this subject considerable study and attention, in my previous practice as mine inspector in the anthracite region of Pennsylvania, and am convinced that such a system as this would operate in a manner as follows:

On a certain date, six men present themselves to a mine foreman for work. Upon examining their cards, the foreman finds them qualified, from Certificate C down to a probation (blue) card. It is not difficult to decide or say whom the mine foreman will select. The cards indicate that the six men have very unequal qualifications, and enable the mine foreman to determine the character of work to which each man is adapted and with which he can be entrusted. The working of this system would grade and classify miners; and, at the same time, act as an incentive that would cause every ambitious miner to strive for the highest grade when he has the knowledge and assurance that efficient service would raise his rank, while carelessness, negligence, or ignorance would lower his qualification. The effect of the working of the system would thus be to establish a school of practical mining that would conduct itself automatically.

While the details of such a system would have to be worked out in each particular case, it appears to me there is much merit in the plan. I would emphasize, in closing, what I have stated previously, that the question for the mine inspector is "How does a miner conduct himself under the conditions in which he is employed"? *A man's work and not his reply to any specified set of questions should determine his qualifications.*

H. D. JOHNSON,
General Superintendent,
Portsmouth Coal Mining Co.
Portsmouth, R. I.

## The Coefficient of Friction

Many readers will have noticed and read with interest both the discussion by Robert McCune, p. 435, and the editorial comment in reply to the same, in the last issue of COAL AGE, Sept. 28, in regard to the value of the coëfficient of friction. The remarks of Mr. McCune have drawn attention to a very important matter in the calculation of mining problems, and one that every student of mining has often felt should be discussed, in order to establish, if possible, a more uniform practice and arrive at a closer estimation of the power required to produce a given circulation of air in any certain mine.

There is no question but that a different value for the coëfficient $k$ will be found applicable to mines that differ in the character of the obstructions they offer to the flow of the air current through them, as explained in our editorial. Mr. McCune's suggestion of using a coëfficient of fewer decimal places, by making it represent the resistance offered by 1 sq.ft. of rubbing surface, to a current having a velocity of 1000 ft. per min., is good. COAL AGE will, in the future, as far as practicable, use a coëfficient $k = 0.02$ instead of that commonly used, $k =$

0.00000002. At the same time, the velocity of the air current must be expressed in thousands of feet per minute, or the quantity of air passing, in thousands of cubic feet per minute, as the case may be.

In all general calculations, we prefer to use the higher value of the coëfficient of friction, $k = 0.02$, in place of the Fairley coëfficient, $k = 0.01$, or any lower value, as suggested by our correspondent; although any of these values may be shown to be correct, in any certain mine.

The method of testing the value of $k$, in any mine, by taking observations at the outby and inby ends of a measured length of airway is good as far as such length of airway represents correctly the entire mine workings, on a basis of the calculated rubbing surface. It is clear, however, that the value of the coëfficient thus obtained would not represent correctly the unit resistance for mine workings and airways with various obstructions such as bends, curtains, timbers, roof falls, etc.

The question is worthy of a full discussion by engineers who have had experience in the ventilation of mines and estimating the power required for any given circulation. We hope to receive the results of tests made in mines, both by the measured length of airway, as suggested by Mr. McCune, and by observations that will include the entire mine workings on the basis of the calculated rubbing surface.

It may be well to suggest, in this connection, that the rubbing surface for the entire mine be calculated by multiplying the average perimeter of the airway by the total length of air travel, assuming that the reduced velocity in the rooms will balance the greater rubbing surface in these places. This would seem to present a fair basis of estimate.

New York. J. T. B.

## Gasoline Engines in Mines

Referring to the inquiry of W. H. Holland, Jr., p. 405, Sept. 21, I notice it is stated in reply, that the steam exhaust of a pumping engine, in a mine, is often turned into the discharge pipe line of the pump. This statement is evidently in error. A little reflection will show that the pressure due to the column pipe and under which the pump is working, would then be exerted on both ends of the pump, namely, the water end and the steam end; and the pump would stand still.

The exhaust steam from a pumping engine, in a mine, should be carried into the suction pipe of the pump; or conducted at once into the sump, several feet below. The exhaust of a gasoline engine can be connected, in the same manner, with the suction pipe of the pump; but this may produce a rather unstable action or condition, in the working of the pump, owing to a certain "slip" arising from the presence of the exhaust gases. A more satisfactory and efficient arrangement, in the case of a gasoline engine, would be to conduct the exhaust gases directly to the return airway; or install a muffler to absorb the objectionable fumes from the gas engine.

J. T. JENNINGS,
Electrical Engineer.

The Philadelphia & Reading Coal & Iron Co., Pottsville, Penn.

## Another Suggestion

Referring to the question asked by W. H. Holland, in regard to conducting the gases exhausted from a gasoline engine, into the discharge pipe of a pump, in a mine; permit me to say that several years of experience enables me to state that a gasoline pump *can* be worked successfully, in a mine, by conducting the exhaust gases into the suction pipe of the pump. The exhaust of the engine should never be connected with the discharge pipe of the pump.

When the engine is arranged to exhaust into the suction pipe of a pump a two-way valve should be inserted in the connection so as to allow the engine to exhaust into the atmosphere when first starting up, or until the pump takes the water. The valve should then be changed so that the engine will exhaust into the suction pipe. By this arrangement, there will be no back pressure on the engine; the exhaust will have free vent, and no check valve will be required.

Du Bois, Penn. P. F. COSTELLO.

[We are glad to have our attention drawn to the fact that the exhaust from a steam or gasoline engine should be conducted at once into the suction pipe of the pump, instead of into the discharge or column pipe. We introduce here a diagram of a pumping engine showing the lower portion of the column pipe, and

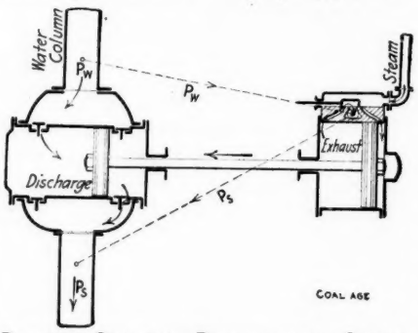



DIAGRAM SHOWING PRESSURES ON STEAM AND WATER ENDS OF MINE PUMPS EXHAUSTING INTO COLUMN AND SUCTION PIPES, RESPECTIVELY

representing by arrows the several pressures under which the pump is acting, including the pressure due to the head of water in the column pipe, the suction head, and the steam pressure driving the pump. Representing these pressures, respectively, by $p_w$, $p_s$ and $P$, two conditions arise, which may be expressed as follows:

Column-pipe connection,

$$P - p_w = p_w + p_s$$
$$P = 2\,p_w + p_s$$

Suction-pipe connection,

$$P + p_s = p_w + p_s$$
$$P = p_w$$

It is clear, from the above, that when the connection is made with the suction pipe, the suction head acting on both the steam and water ends at the same time, is balanced. In this case, the steam pressure acting to drive the pump is opposed only by the discharge head in the column pipe; assuming, of course, equal areas of section in the steam and water ends of the pump and disregarding friction.

If, however, the connection is made with the discharge pipe, the steam pressure acting to drive the pump, is opposed by the discharge head, acting equally on the steam and water ends; and also by the suction head, which, in this case, is unbalanced.

This discussion will prove of great help to those using gasoline engines, in mines. The "slip" referred to by our first correspondent, which he states causes an unsteady motion of the pump, is always liable to occur when gas or air is allowed to enter the suction pipe. The gas or air in this pipe is carried, at once, into the pump cylinder, along with the water; and, since the gas or air is compressible, the moment the pump reverses there is a jump or slip due to the compression of the gas or air. The water is practically incompressible. When steam is exhausted into the suction pipe, it is at once condensed and this trouble does not arise.—EDITOR.]

## Refilling Coal Workings in Germany

Owing to a large increase in the number of claims for compensation due to subsidence and other damage to the surface, colliery proprietors in Düsseldorf are largely adopting the hydraulic method of stowage to replace the coal which has been drawn from the mines. Where sand is not available for the purpose a mixture of pit waste, slag, ashes, brick, etc., is ground and flushed into the mines through pipes. Their diameter is usually 7 inches and they are generally constructed of steel.

The cost of stowage varies from 11c. to 22c. per ton, according to the material available. It is maintained that the employment of the process enables the amount of pit timber to be reduced and the yearly output of coal to be increased. In many cases, where hydraulic stowage has been introduced, the pillars of coal which formerly had to be provided for the support of railways and buildings have been rendered unnecessary.

Liverpool, England. L. T. C.

# Examination Questions

**Selected from State Examinations, or Suggested by Correspondents**

## Interesting Questions

### THE BAROMETER

*Ques.*—Describe the construction of the mercurial barometer.

*Ans.*—The mercurial barometer consists of a glass tube, from 32 to 33 in. long closed at one end. This tube is first filled with mercury, which is then boiled to expel any air. This being done, the tube is inverted by temporarily closing the open end to prevent the escape of the mercury. The open end being dipped beneath the surface of the mercury contained in a basin, the mercury in the tube will fall and rise alternately, until it finally comes to rest at a height above the level of the mercury in the basin, such that the pressure of the atmosphere will support. By reason of its weight, the atmosphere presses equally on each unit of area of the surface of the mercury in the basin, except the area occupied by the column of mercury in the tube, as illustrated in Fig. 1.

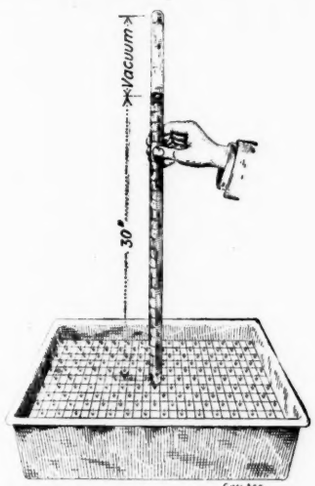



FIG. 1. ILLUSTRATING THE PRINCIPLE OF THE BAROMETER

Since the space in the top of the tube, above the mercury column, is a vacuum (Fig. 1), there is no pressure on the top of the column; and its weight, resting on the surface of the mercury in the basin, is equal to the pressure of the atmosphere for the same unit of area. If the weight of the mercury column, therefore, is calculated for a sectional area, of say 1 sq.in., the result will give the atmospheric pressure for the same area, or in pounds per square inch.

Thus, the weight of 1 cu.in. of mercury being 0.49 lb., the weight of a column of mercury, 1 sq.in. in section and 30 in. high is $0.49 \times 30 = 14.7$ lb., which is the normal atmospheric pressure at sea level, or the pressure per square inch corresponding to 30 in. of mercury column.

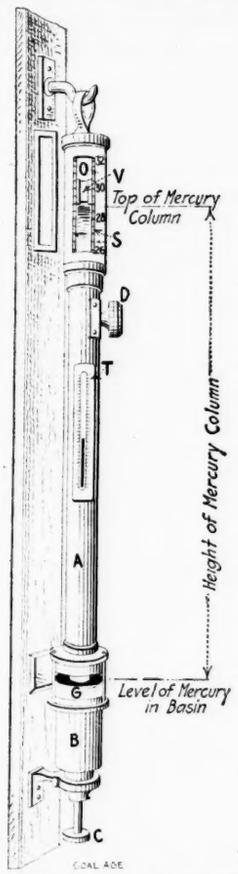



FIG. 2. SHOWING THE STANDARD MERCURIAL BAROMETER

Fig. 2 shows the common form of mercurial barometer. The tube containing the column of mercury is surrounded by a metal case *A*. The lower portion *B* of this case is expanded to hold a glass cylinder *G*, which forms a well or basin for the mercury. To the lower end of this glass cylinder is attached a chamois-skin bag, forming the bottom of the basin or well. The screw *C* operates against this bag of mercury to raise or lower the level of the mercury in the basin.

The top of the mercury column is observed through the opening *O*. in the metal case. At the side of this opening is a scale *S*, graduated, in this case, from 26 to 32 in. To this scale is attached a long rod reaching downward within the metal case and terminating in a sharp point that can be seen through the glass cylinder *G*. By means of the screw *D*, the vernier *V* is set to the top of the mercury column, and its position read on the scale *S*. Before setting the vernier, however, it is necessary to adjust the level of the mercury in the basin, by means of the screw *C*, so that the point of the rod, which marks the zero of the scale, just pricks the surface of the mercury in the basin. The reading of the vernier at the top of the mercury column then indicates the exact height of the barometer.

A thermometer *T* is attached to the metal case for the purpose of observing the temperature at the time of reading the barometer, so that the reading can be reduced to a standard of 32 deg. F. All barometer readings should be reduced to this standard for the sake of comparison, before they are recorded.

*Ques.*—Explain and give the equivalents of barometric pressure (in. of mercury) in the following terms: (a) air column, in feet; (b) water column, in feet; (c) water gage, in inches.

*Ans.*—(a) To determine, exactly, the air column corresponding to any given barometric pressure, it is necessary to know both the average temperature and the average pressure of the air. Assuming the weight of 1 cu.ft. of air as 0.076 lb., however, 1 in. of barometric pressure corresponds to 930 ft. of air column. Practically, at or near sea level, 900 ft. of depth or height corresponds to 1 in. increase or decrease, as the case may be, of barometric pressure. For example, roughly speaking, the barometric pressure, at the bottom of a shaft 900 ft. deep, is 1 in. greater than that at the surface.

(b) To find the water column, in feet, corresponding to any given barometric pressure (in. of mercury), multiply the mercury column, in inches, by 1.13; or to find the corresponding water gage, in inches, multiply the mercury column, in inches, by 13.6; since mercury is 13.6 times as heavy as water. Expressed briefly, these equivalents are

1 in. mercury = 900 ft. air column, about;
1 in. mercury = 1.13 ft. water column;
1 in. mercury = 13.6 in. water gage.

*Ques.*—Does the effect on the mine atmosphere precede or follow a change in atmospheric pressure, as indicated by the barometer at the surface of the mine?

*Ans.*—In general, indications of the barometer, denoting changes in the atmospheric pressure, precede the effect in the mine by which dangerous conditions are produced, from 2 to 3 hours.

# Sociological Department

**For the Betterment of Living Conditions in Mining Communities**

## Frick Coke Co.'s Welfare Work

SPECIAL CORRESPONDENCE

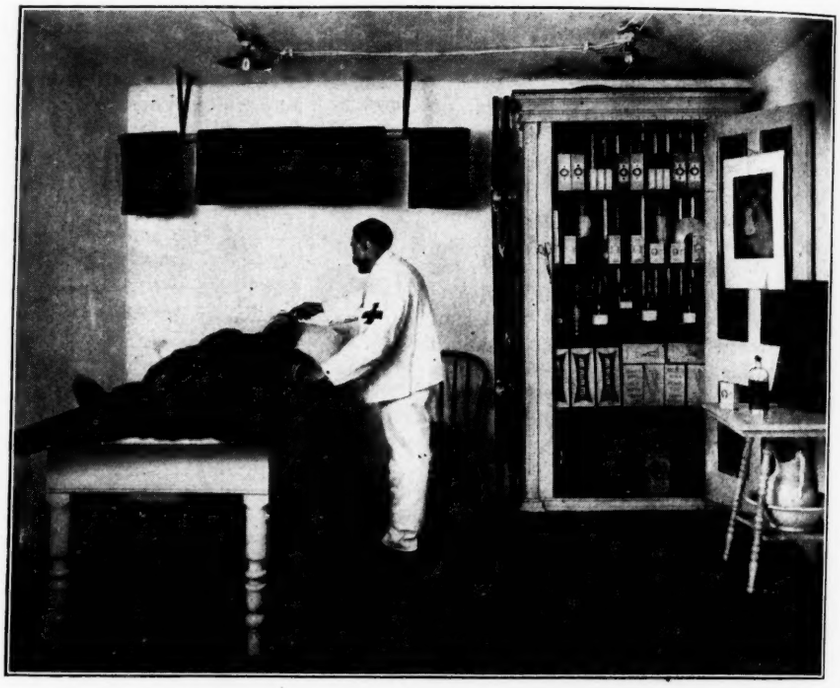
In the issue of Sept. 7, I commented on the playground of the H. C. Frick Coke Co., and on the front page of that issue was illustrated the recreation ground at the Phillips plant. At evening this recreation ground is lighted by festoons of electric lights.

As one writer has said, "It resembles a pleasure resort more than the adjunct of a coke corporation." Every colliery has its own band, and when work is over in the evening, this band plays on the playground, and the miners' families troop out to hear the music.

### GARDENS WORTH A QUARTER OF A MILLION DOLLARS

It is estimated that the H. C. Frick Coke Co.'s men produce in their gardens at 63 active plants, vegetables worth $236,250 every year. When it is remembered that in some villages, built by other companies, few of the houses have gardens because of lack of opportunity which the environment provides, it will be seen readily that the work of the Frick company has been more than justified.

And when we consider that it has been accompanied by the improvement in the personnel, which inevitably results from creating opportunity to fill with profit the hours of idleness between the day's work and the night's rest, we realize that it has been well worth while.



UNDERGROUND HOSPITAL AT LEISENRING NO. 2

INTERIOR OF THE RONCO HOSPITAL

By giving three prizes for the best gardens and three for the best lawns at each plant, a chance is given to every man to be rewarded and distinguished. This is only the second year that the company has interested itself in the gardens, but it is abundantly proved that the work has taken firm root in that short time.

### MAKING COKE TOWNS BEAUTIFUL

At Ronco there are 155 houses, 137 of these have gardens and 132 have lawns. So much for the work of the miners, but, in addition, Ronco has been located on a fine plot 150 ft. high, overlooking the winding reaches of the Monongahela River, and the smoke of the ovens is carried away down the stream. So the men, the company and nature have combined to make Ronco a model village.

Of course, the company is not leaving all the decorating of the ground to the men. It is showing its interest in the matter by keeping its own buildings clean and inviting. The power house of Continental No. 1 is decorated with ivy and this adds to the beauty of the village. Extensive hedge planting and the setting out of shade trees, add to the beauty of the surroundings.

Many of the lots at Leith measure 80 by 130 down to 40 by 130 ft., so there

THE H. C. FRICK COKE CO. TAKES AN ACTIVE INTEREST IN PROMOTING HEALTHY BASEBALL

is room for gardening development. The houses rent for $7 a month and the charge covers free water, electric light and fuel. All the houses have stone cellars with five or six rooms and all the outside closets have cement vaults with sewer connections. The H. C. Frick Coke Co. prides itself on throwing open its streets. Though they are situated on its own private grounds, they are wide open to hucksters and peddlers. The company invites the fullest competition between the stores of the United Supply Co. and the outsiders.

### SWIMMING, SKATING, BASKET BALL, BOWLING, TENNIS AND CROQUET

At Leisenring No. 1, a swimming tank of concrete has been built, with a shower bath for men and another for women. Wires are stretched across the pool, from which electric-light bulbs hang, illuminating the water at night. Tuesdays and Fridays are set apart for the ladies and their escorts. Bathing suits are supplied by the Union Supply Co. at cost. The pool measures 36 by 75 ft. and runs from 2½ to 7 ft. deep.

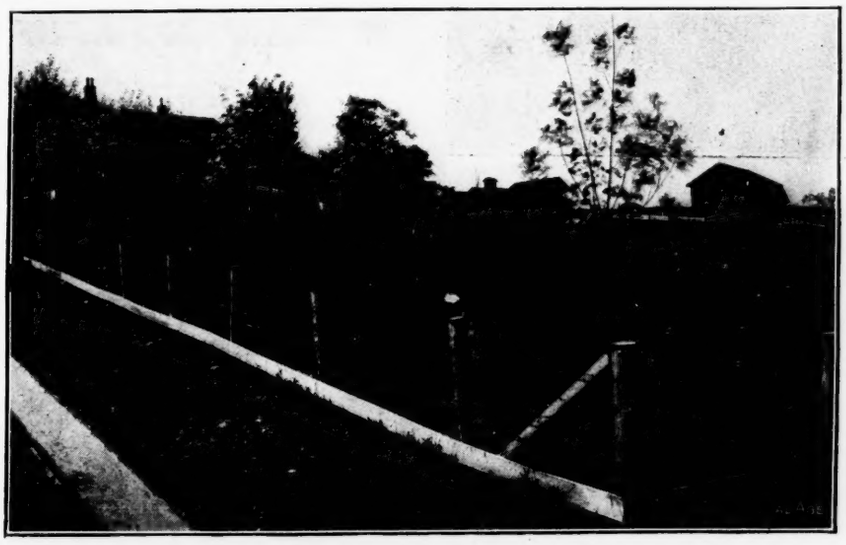
Adjacent to this pool the company is erecting a recreation building, at which there will be installed floors for roller skating and basketball. Bowling alleys will also be built and all these will be free to employees of the plant.

At the York Run colliery, the company has laid out and rolled tennis courts and croquet grounds, not alone for the superintendents and foremen, but for the miners. Very expert are the young Slavs about the plant in these games.

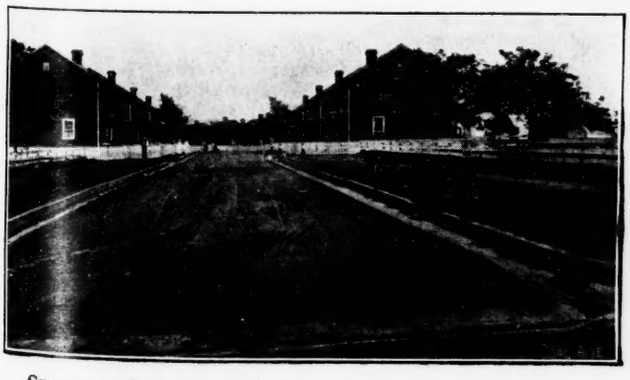
If the H. C. Frick Coke Co. has been careful to take care of its men above ground, it has had even more solicitude for the men below. The lead of the anthracite corporations has been enthusiastically followed by the Frick company, and it is doubtful if any of the hospitals in the hard-coal region are as good as those which the Frick company have installed and which are illustrated herewith.

### A HOSPITAL WHERE THE PATIENT IS FREE FROM INFECTION

Such places should be models of simplicity. Pictures, lounges and wooden chairs, are all sources of fire risk and they are also a possible means of infection and should be avoided. The Ronco



SHAFT PARK AT LEISENRING NO. 2, FAYETTE COUNTY, PENN.



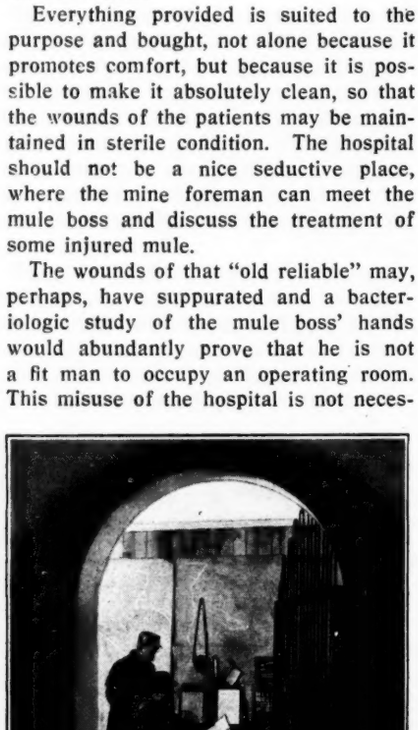
STREET AT STANDARD NO. 2, WITH CURBS, SIDEWALKS AND GUTTERS OF CONCRETE

FRONT STREET AT THE UNITED MINE, WESTMORELAND COUNTY, PENN.

hospital, while it is above ground, shows what an underground "emergency ward" should contain.

Everything provided is suited to the purpose and bought, not alone because it promotes comfort, but because it is possible to make it absolutely clean, so that the wounds of the patients may be maintained in sterile condition. The hospital should not be a nice seductive place, where the mine foreman can meet the mule boss and discuss the treatment of some injured mule.

The wounds of that "old reliable" may, perhaps, have suppurated and a bacteriologic study of the mule boss' hands would abundantly prove that he is not a fit man to occupy an operating room. This misuse of the hospital is not necessary, as the mine foreman has a comfortable underground office in many of the Frick mines.



A MINE FOREMAN'S OFFICE IN A FRICK MINE

It is almost needless to refer to what the H. C. Frick Coke Co. has done to promote safety. Everywhere the phrase "Safety the first consideration" meets the eye. Even the children see it on the semi-circular arch over the gateway as they enter their little recreation ground at Phillips.

### TELEPHONES AND SAFETY

All through the mines are telephones which connect the face with the surface. They should, however, hardly be mentioned in connection with safety, because they appeal so strongly from the point of view of operative efficiency that no company could class them by any stretch of imagination as provisions for the welfare of their men, though that they subserve that end has been proved in several recent disasters.

It must be confessed, however, that this proof has not been furnished in the mines of the H. C. Frick company, at least not in recent years. Owing to the care which has been exercised, they have been able to avoid any serious mishaps. But the ease with which the doctor and the ambulance are summoned by telephone after an accident make the help or neglect of that instrument, in small accidents, often a matter of life or death.

## National Mine Rescue and First Aid Conference

**A conference to discuss mine-rescue work and first-aid was called together by the Bureau of Mines and assembled in the library of the Bureau on Sept. 23.**

**After an address by J. W. Paul, committees were formed and the meeting adjourned till the following day.**

**A list of the committees follows:**

Rescue apparatus and rescue training, D. J. Price, secretary; J. W. Paul, H. P. Dowler, Edward Elliott, D. K. Glover, William Nesbit, G. H. Hawes, Morgan Price and Austin King.

Rescue operations, G. H. Delke, secretary; B. J. Matteson, John Meagher, H. P. Zeller, T. F. Lynch, F. V. Cunningham, John P. Reese, and William A. Raudenbusch.

First aid methods, E. B. Sutton, secretary; Dr. W. S. Rountree, Dr. W. G. Richards, Dr. A. F. Knoefel, Dr. J. W. Parshall, Dr M. J. Shields, Dr. J. H. Young, Ralph McHenry, Dr. J. W. Kennehan, William A. Raudenbusch, W. D. Roberts, Atherton Bowen, J. E. McDonald.

Committee No. 5—J. J. Rutledge, C. G. Braghm, Dr. M. J. Shields, Dr. J. W. Kennehan, Dr. McKee, Dr. J. H. Young and Jesse Henson.

First aid contests—J. C. Roberts, secretary; T. B. Dilts, G. W. Barager, Henry Owens, E. W. Judd, M. E. Bach, John L. Simons, Dr. M. J. Shields, H. P. Dowler and Dr. Rountree.

Hospitals and safety stations—C. O. Roberts, secretary; Dr. J. W. Parshall, Dr. Hawes, T. I. Stephenson, R. B. Moss, John Meagher, Dr. W. S. Rountree, Dr. Ralph McHenry, G. W. Hutchinson and Dr. G. H. Halberstadt.

Organization—H. M. Wilson, secretary; Austin King, J. P. Reese, Dr. W. S. Rountree, Dr. M. F. Kneefel and F. B. Nold.

**The subjects discussed are listed below and are full of interest.**

#### FIRST AID METHODS

1. Resuscitation from gas, electricity and shock; methods of artificial respiration.
2. Treatment of dislocated shoulder and hip.
3. Method of splinting a broken back.
4. Manner of applying splints to the limbs. Should a long splint be used in all cases?
5. Should a first-aid man try to reduce a dislocation?
6. Should the triangular bandage be used in preference to the roller bandage?
7. Should a first-aid man attempt to wash a wound?
8. In case of a severe hemorrhage, which is controlled with a tourniquet, and where no sterile dressing is obtainable, what is the correct treatment?
9. Methods for transporting the injured, having regard to the needs of various injuries?
10. Methods of rescuing patient from electric contact, and the most important thing to do first.
11. System in handling patient from place of injury to surface.
12. Development and acceptance of new methods and dressings.

#### FIRST-AID TRAINING

1. What are the duties of a first-aid mine worker?
2. What kind of instruction, and how much should a first-aid worker receive?
3. What kind of training and practice, and how much should be given?
4. Systems of training: Red Cross, navy or new combination. Value of a standard system for miners.
5. Methods of organizing first-aid corps.
6. Number of trained men per 100 miners.

#### FIRST-AID CONTESTS AND EXHIBITIONS

1. Relative merits of contests and exhibitions; intra-company, inter-company, state and inter-state.
2. Standardization of methods of judging, number of judges, method of marking, etc.
5. Proper rating for speed.

#### MINE HOSPITALS AND MANAGEMENT

1. Economic value to company and men of first-aid training and hospitals.
2. Number, kind and management.
3. Underground first-aid stations and equipment.

#### BREATHING APPARATUS, SAFETY LAMPS AND APPLIANCES

1. Method of testing breathing apparatus.
2. Spare parts and repairs.
3. Safety and electric lamps.
4. Emergency equipment at rescue stations.
5. Use of birds and mice.

#### TRAINING WITH BREATHING APPARATUS

1. Physical examination and requirements of persons given training.
2. Physiological effect of pressure on the head due to wearing helmet; likewise of wearing nose clip.
3. Outline of course of construction and training necessary to qualify for rescue work.
4. Diet of men doing rescue work.
5. Organization of rescue crews—how best to secure volunteers for the work, compensation of volunteers, etc.
6. Amount of oxygen required in training.
7. Merits of smoke room, outdoor and underground training.

#### CONDUCT OF RESCUE OPERATIONS

1. Use of untrained men in rescue work.
2. Outline of procedure before and after entering a mine following explosions or mine fires.
3. Maximum distance rescue crews should proceed beyond fresh air.
4. Necessary rest for rescue men and limit of hours of work.
5. Cumulative effect of imbibing poisonous gases.
6. Use of stimulants.

**The doctors did not consider the outlay of money for underground hospitals justified. They believed that the best place for an injured man was outside in the open air.**

**Despite the opinion of the American Medical Association, the Sylvester method of resuscitation received the approval of the doctors present.**

# Coal and Coke News

**From Our Own Representatives in Various Important Mining Centers**

## Washington, D. C.

Methods of purchasing coal for resale in the Panama Canal supply depots and of testing such coal to assure that it is satisfactory in quality are now being carefully studied by government officers in the attempt to work out a scheme that will operate adequately and guarantee efficient service. In studying this subject, attention has been attracted to the system that is employed in the New York City purchases of coal, under the scheme devised and introduced there a few months ago and which has been giving great satisfaction to the officials who have examined it most carefully. Information with reference to the methods of the New York purchase plan has been obtained and carefully analyzed to see how far it will be applicable in the Panama Canal work.

The chief element of the New York City system that has received notice is that which provides that all coal purchased shall be used while payment is made only after the result of subsequent chemical analysis is obtained from samples fairly and honestly taken in the presence of the contractor or his representative. If the result of such analysis shows that the coal delivered is up to the average of medium grade no penalties can be imposed under the specifications; but if the quality falls below that grade, penalties begin to apply in proportion as the physical requirement in the coal delivered fails to come up to the grade specified. An alternative plan would be to analyze the coal before accepting it, but the difficulties found inhering in this plan are considerable. The new scheme takes the coal, and if it is found that an excess of slate exists in what is delivered, or if there is an excess of ash, thereby reducing its steam-producing powers, the burden falls on the contractor, who is required to pay penalties corresponding in amount to the extent in which his coal falls below the standard requirement.

The following is one of the methods of analysis of coal which is being considered by the authorities:

The percentage of moisture determined in the first analysis shall be final, notwithstanding the results that may be obtained in a later analysis of the same sample.

If the first analysis shows that the coal is deficient in heat units, or contains greater percentages of ash, volatile combustible matter or volatile sulphur, than specified herein for that particular size and kind of coal called for in the schedule of quantities in this contract, and, if the contractor questions the accuracy of the first analysis of the coal suplied by him, he may, within a period of ten (10) days after the date on which the contractor is notified by the city of the results of the first analysis, request, in writing, the making of a second analysis of the remaining portion of the identical sample of coal previously analyzed. The results of this second or check analysis shall be deemed final and shall be used to determine the gross weight on which payment shall be made under this contract for all coal represented by the sample so analyzed. If the aggregate deductions in gross weight computed on a basis of the results of the second or check analysis equals or exceeds the aggregate deductions in gross weight computed on the basis of the results of the first analysis then the contractor shall be charged with the cost and expense of such second or check analysis and the sum of ten dollars ($10) therefor shall be deducted by the city from a subsequent payment to be made under this contract. All deductions, except for excess moisture, shall be based on the result of this second or check analysis.

An examination of the methods employed in New York City shows that there is kept in the records under the new system information as to the contractor furnishing the coal, the kind of coal delivered, the amount delivered, the price, the total cost of delivery, the moisture deduction, the B.t.u. deduction, the ash deduction, the volatile-matter deduction, and the volatile combined sulphur deduction. These taken together give the total deduction to be made for defects in the coal and show how much of a penalty as determined by the scale or system of penalties provided for in the statement to the contractors must be collected in each case. With some modifications, it is believed that the plan would work well in making the purchases for the Panama Canal.

### As To a Coal Famine

According to preliminary information brought back to this city by government agents who have been carrying on the coal investigation in which the government is engaged as a means of testing the legitimacy of the advance in the price of coal, the extent of the alleged coal shortage likely to occur during the coming winter has been considerably exaggerated. They assert that there is now no reason to fear any considerable shortage during the winter, provided the mining process goes on as at present, and is not again disturbed to any unusual degree. The general results of the inquiry are being carefully guarded, since the return of Commissioner of Labor Charles P. Neill, inasmuch as he believes that the drift of the statements he is to make regarding the legitimacy of the advances in price and the degree in which they are attributable to higher wages should be kept secret until toward the time of the reconvening of Congress.

### Investigations Into the So-called Money Trust

Samuel Untermyer, the New York lawyer, who is engaged in investigating the so-called money trust, is taking in a good many other things and has had a force of men at work investigating the returns received by the Interstate Commerce Commission from railroads, while he has also asked for the use of the corporation tax returns. Among other things that are said to be coming within the scope of his inquiries are the relations between the mining industry in certain of its phases and the banks and railroads of the country. This appears to be taking the inquiry rather far from its original purpose, but it had already strayed quite a long distance from its supposed object.

## Pennsylvania

### Anthracite

The mining of 91,000,000 tons of anthracite coal in 1911, according to the Bureau of Mines, suggests strenuous days of underground work. It is about 11,000,000 tons more than in any previous 12 months, and there is no indication this year that the increasing demand will go beyond the supply.

*Wilkes-Barre*—The labor trouble at the several collieries of the Lehigh & Wilkes-Barre Coal Co. has not yet been cleared up, and all efforts to get the men to return to work seem unavailing.

Six mines of the Delaware & Hudson Coal Co. have suspended operations, due to a car shortage. The shortage of cars occurs annually at this time of the year. Railroad men say that the reason for this is the fact that all cars sent West with coal are kept there until they are loaded with produce before they return East.

*Scranton*—With most of the locals of the United Mine Workers of America furnished with the working rates as handed down by the Anthracite Strike Commission of 1902, the majority of the

anthracite miners and laborers in District No. 1 are now receiving the rates agreed upon in the recent agreement. The re-establishment of the old rate for certain work with the increased 10 per cent. is making big gains in wages for many of the mine workers.

*Tamaqua*—The strike of the 9000 miners in the Panther Creek Valley, who have been idle for four weeks at an estimated loss in wages of $150,000 because of the refusal of two men to wear union buttons, was settled, Sept. 27, when the strikers voted unanimously to return to work.

The controversy, which hinged on the employment of two nonunion men by the Lehigh Coal & Navigation Co., was adjusted by the company agreeing to send them on an unlimited vacation.

BITUMINOUS

*Somerset*—The boiler house and shaft of the Somerset Fuel Co. was destroyed by fire, Sept. 21, with a loss of about $3500.

Anthony Solitoni, charged with violating the state mining laws, entered a plea of guilty, Sept. 23, and was sentenced to pay the cost and a fine of $25. He is alleged to have neglected to take down dangerous coal, slate and rock, and to set sprags in undermining coal.

*Fallen Timber*—The Fallen Timber Coal Co. has made application for a charter and it is proposed to open from three to five new mines in the near future in order to develop a tract of 500 acres. Two of the mines will be put in operation as soon as possible and 200 men will be employed.

*Bentleyville* — Because some union workmen were discharged at the Acme mine of this place, the miners are out on a strike. The officials from Pittsburgh are here adjusting matters, and it is thought that the miners will be back at work soon.

*Belle Vernon*—About 400 miners employed at the Tremont mine went on a strike, Sept. 21, as a result of the failure of the Pittsburg Coal Co. to comply with the pecuniary demand made upon them by the tipple workers or men employed as laborers on the outside of the mine.

*Fayette City*—At the New Warner coal mine near here, 100 miners are out because a driver was discharged by the superintendent. The men declare they will not return to work until the driver is reinstated.

## West Virginia

*Wheeling*—Two hundred miners were entombed by a cave-in at the mouth of the Yorkville mine Sept. 24. They finally made their escape through a narrow passage a mile away.

*Charleston*—There is but little change in the strike situation in the Kanawha district. The operators are still firm in their position and reiterate their statement that they have nothing to arbitrate and can, under no circumstances, recognize any labor organization. The miners, on the other hand, are equally determined and deny the statement that the International Organization has any arrangements with Indiana, Ohio, Illinois, or Pennsylvania coal operators to organize the West Virginia miners in the interest of outside states. They affirm that the miners of West Virginia have been laboring under oppressive methods for many years.

## Alabama

*Birmingham*—The Sloss-Sheffield Coal and Iron Co. according to official announcement will operate the Brookside coal mine which has been abandoned for more than ten years. Grading and other preliminary work on the mine has already been begun, and it is expected that it will be in operation about Nov. 1.

*Birmingham, Ala.*—Local newspapers are waging a war on the commissary of coal and iron companies and are endeavoring to secure legislative enactment prohibiting commissary attachments at mining, furnace and steel plants. In most instances, the coal companies are compelled to operate stores to provide provisions and other things for employees, the mining camps being segregated. The newspapers attack the commissaries of the coal and iron and steel corporations, which have works in and within the immediate neighborhood of Greater Birmingham.

*Birmingham, Ala.*—Announcement is made of the purchase of the properties of the Milner Coal & Railroad Co. by G. B. McCormack and Erskine Ramsay, of Birmingham. The properties include 8000 acres of coal lands at and near New Castle, on the Louisville & Nashville R.R., less than 20 miles north of Birmingham, together with 361 beehive coke ovens, 350 employees' houses and other mining apparatus.

*Ensley*—The Tennessee Co. is making rapid progress in the construction work at their new mine west of here. They are placing the heavy machinery, including the boilers for the air compressors, fans, and other power appliances. About 50 men are at work.

## Kentucky

*Whitesburg*—The upper Cumberland River coalfields of Letcher county are attracting considerable attention, and it is said that preparations are being made for the extension of the Wasioto and Black Mountain R.R. into this important coalfield. The projected road will be about 15 miles long and, taken all in all, will be one of the most important short lines yet projected in eastern Kentucky.

The Sandy Valley & Elkhorn R.R. constructed to reach a 100,000 acre tract of coal in the Elkhorn district of Kentucky will be turned over by the contractors and operations undertaken Oct. 1.

*Middlesboro*—Two men were killed and another fatally injured by an explosion of gun powder in the mines of the Continental Mine Co. Sept. 20. Another man was also severely burned. The cause of the explosion is not known.

## Ohio

*Columbus*—A federal rescue car, equipped with all the latest apparatus for life-saving purposes in case of coal-mine accidents, will be brought to Ohio, Oct. 1, to be used in demonstrating modern life-saving methods to the miners.

A number of large coal operators have been compelled to reduce operations, in some instances as low as 25 per cent. of capacity, as a result of the car shortage. Inability to get coal transported from the mines is entirely the cause of making a considerable number of miners idle a good part of the time.

## Indiana

*Brazil*—The water has been removed from Miami No. 4 mine, and operations have been resumed.

*Clinton*—The bi-weekly pay received by the Vermillion County miners Sept. 25 is said to be the largest for a corresponding period in years. Operators in this field say their mines are working every day that they get sufficient cars to load the coal.

*Jasonville*—Charging that J. R. Connelly and C. H. Jones, stockholders in the Calora Coal Mining Co. conducted the business of said company without due regard to the wishes and interests of other stockholders, A. H. Kuhn et al. have brought suit for a receivership. It is claimed that the Central Coal & Mining Co. contracted to sell the output of the Calora Co. at market price, receiving a commission of 5c. per ton. In order to make this commission large, considerable quantities of coal were sold at prices far below the market. It is, therefore, alleged that the Calora Co. is on the verge of insolvency.

## Illinois

*Springfield*—The Capital Coal Co. is made defendant in a suit to foreclose on a mechanics lien filed by the Jeffrey Manufacturing Co., in the Circuit Court. The plaintiff's declaration states that the Collieries Co. is indebted to the extent of $21,165 as a balance due for the construction of a new tipple and other works at the company's mine.

*Princeton*—The entire time of the Circuit Court, at Princeton, will be taken up with the Cherry mine disaster suits. There are 113 of these suits against the St. Paul R.R., aggregating more than $800,000. It will be recalled that 265 miners lost their lives when the mine was destroyed by fire, on Nov. 13, 1909.

## Missouri

*Unionville*—The new coal mine, which was originally intended to be sunk on the Brawford place south of town, will be on the A. W. Shelton farm, northeast of town, as a much better prospect is obtained at the new place. The work of sinking the shaft will be begun in the near future. Three shifts of five men each will be put to work and the work will be pushed with all diligence until the shaft is completed.

## New Mexico

*White Oak*—Splendid deposits of a good grade of coal have been developed by the Old Abe Co., on the 160 acres of ground belonging to it. The coal vein is 4 ft. thick and has for years supplied a near-by mining camp with all the coal used for steam and domestic purposes.

## Colorado

*Walsenburg*—Rather than accept a reduction of 15c. a ton for mining coal, 75 men employed at the Gordon mine, five miles northwest of Walsenburg, went on a strike, Sept. 16. The strike was not called by any representative of the union, the men acting in accordance with the desires of a mass meeting, called that morning to discuss the proposition of a decrease in wages.

## Foreign News

*England*—Three new mine-rescue stations are said to be established in the English counties of Durham and Northumberland, similar to the one already in existence near Newcastle.

At each station there will be kept ready for use not less than 15 sets of portable breathing apparatus, 20 electric hand lamps, four sets of oxygen reviving apparatus, an ambulance, box or boxes provided by the Ambulance Association, or similar boxes, together with antiseptic solution and fresh drinking water; also cages of birds and mice for testing for carbon monoxide. The necessary motor vehicles and fire engine will likewise be provided.

The breathing dress to be used is, it is claimed, a considerable improvement upon the apparatus used earlier at the Newcastle station. By its use a man may remain in a poisonous atmosphere for three hours and may do without much inconvenience whatever work is required underground.

*German Mine Disasters*—Firedamp explosion. By a firedamp explosion in the "Westende" colliery near Duisburg—Meiderich five miners were killed on Sept. 11.

Cave of an abandoned coal pit. On Sept. 17 Urbanus shaft near Bochum owned by the Mansfeldsche Genverk-shaft caved in. It had been abandoned without removing the buildings several years ago and its mouth filled with rock. The caved ground covers an area of 50 square meters and its depth is estimated at 154 m. No lives lost, but neighboring buildings had to be vacated.

Stassfurth, Sept. 18, at Shaft IV of the New Stassfurt potash mine four miners were killed by a powder explosion.

## Chronology of Coal Mining for September

*Sept.* 3—Sixty-one persons killed by a gas explosion at Pas-de-Calais, France.

*Sept.* 12—Many interesting and instructive experiments on mine explosions conducted at Bruceton, Penn., on this and succeeding dates.

*Sept.* 17—Twenty men killed and many others injured by collapse of partition in Augusta Victoria Mine, Germany.

*Sept.* 20—Eight thousand men go on strike at Pottsville, Penn.

*Sept.* 25—Several small railroads in southwestern Pennsylvania consolidated with the Baltimore & Ohio.

## Personals

J. Fred Mills, of McAlester, Okla., is promoting a company that will be chartered to develop new coal mines in the eastern part of that state.

The directors of the Lehigh Valley Coal Sales Co. have elected G. N. Wilson president of the company, W. R. Evans vice-president, W. K. Burton secretary. These promotions were consequent upon the death of former President Skeele.

J. T. Reynolds, Foreman Miner of the U. S. Bureau of Mines Rescue Car No. 7, has resigned his position, effective September 25th, 1912, on account of ill health of his wife. Mr. Reynolds will take up work in Leechburg, Penn., in the future.

C. M. Gates, who has been for years mine inspector and superintendent for the U. S. Coal & Coke Co., at Gary, W. Va., has accepted the position of superintendent of the Crystal Block Coal & Coke Co., of Rawl, W. Va. He will assume his new duties in a short time.

Reese H. Beddow, of Lincoln County, N. M., has been appointed to the position of State coal mine inspector by Governor McDonald to take the place of Joe E. Sheridan, of Silver City. It is announced that the new inspector will at once inaugurate a thorough inspection of conditions obtaining at all of the collieries of the state.

Thomas Thomas, division superintendent of the Wyoming Division, Lehigh Valley Coal Co., has been promoted to the position of superintendent of mining, to fill the vacancy caused by the promotion of F. M. Chase to general manager. John H. Haerter, division engineer of the Wyoming Division, has been appointed division superintendent in Mr. Thomas' place.

Geo. F. Baer, of the Reading Co., received a large number of congratulations recently on the occasion of the seventieth anniversary of his birth. In speaking to several newspaper men as to his own tenure of office, he said he thought it the duty of the "old man" to stay on the job a while longer while he was good for a day's work. He also stated that he had no notion of deserting the Reading Co. pending the settlement of important matters which are now before the courts.

The appointment of W. H. Donner to the head of the Cambria Steel Co. in place of Chas S. Price, whose resignation was presented and accepted because of his ill health, is regarded here as an evidence that the H. C. Frick interests will dominate the councils of the steel company. Mr. Donner has been associated with H. C. Frick in many of his interests. The steel company is a large coal producer and user, those interests being under the superintendence of M. G. Moore under the new management, his title has been changed to that of chief engineer.

## New Publication of the West Virginia Geological Survey

There has just been issued from the press a new publication by the West Virginia Geological Survey, Morgantown, W. Va. This volume is described in the following extract from the printed circular of the Geological Survey, and the reader is also told how to secure the publication in question.

(1) Detailed County Report on Doddridge and Harrison Counties, under date of Sept. 1, 1912, 712 pages +XVI, with 29 plates of illustrations and 5 figures in the text, and a case of 3 maps (soil, geologic and topographic) of the entire area in single sheets. In addition to the detailed study and description of all the rocks, coals, limestones, clays, minerals, soils, streams and industries, with hundreds of oil- and gas-well records, occurring within the area and given in this report, the geologic map gives the structural contours on the Pittsburgh coal, and thus is very valuable to anyone interested in coal, oil, or gas, in showing the exact positions of all the anticlines, synclines, and structural terraces. The line where the Pittsburgh coal of commercial thickness and value disappears in Doddridge county is shown with much more accuracy on these maps with their larger scale of 1 in. to the mile, and containing all roads, streams, houses, etc., than was possible on the state map with its much smaller scale. The soil map and report by the experts of the U. S. Department of Agriculture, and the topographic map, exhibit the usual features given in other County Reports. Price, with case of maps, delivery charges paid by the Survey, $2.

## Construction News

**Woodward, Ala.**—The Woodward Iron Co. are doubling the size of their koppers byproduct coke-oven plant at Woodward, Ala. J. H. Woodward, of Birmingham, is president; A. H. Woodward, of Woodward, is vice-president, and Morris Woodward is general superintendent.

**St. Charles, Va.**—The owners of the Black Mountain coalfield, in Virginia, are building at St. Charles, which is in the center of that mining district, a big power station. Primarily it is to be a central station to furnish electricity to the various mines.

**Sugar Notch, Penn.**—A notice has been posted at the Hadleigh Colliery, Sugar Notch, Penn., stating that it will be shut down until further notice on and after Oct. 1. The colliery is controlled by the Pittston Coal Mining Co., an independent concern, and officials of the company say that work will not be resumed until a new breaker is erected, which will probably take until Jan. 1, 1913. The old breaker was built almost forty years ago by William Maffet. It will be torn down to make room for a new and more modern structure. Work on the new breaker will be commenced in a few weeks. About 2000 employees are affected by this order. When operations are resumed, employment will be given to an increased number of men.

**Grand Rapids, Mich.**—Breen & Holladay are building a modern type of coal dock at Franklin St. and the railroad crossing. It is to be 42 ft. wide, 300 ft. long and 27 ft. high, of fireproof, reinforced concrete, and will be inclosed in corrugated iron. Loaded cars will come along the side hill from the south upon the dock and the coal will dump into bins below the track. The coal will all be handled by gravity and without loss of time. The dock will have a capacity of about 6000 tons and will be the only dock of the kind in the state.

**West Allis, Wis.**—The West Allis Fuel & Supply Co. has completed its new coal yard located on the Allis-Chalmers Belt Line Ry. and began hauling fuel Sept. 18. The company was organized by Elmer I. Lindow and Julius Ranistewski, both well known business men of West Allis, who have had years of experience in the coal business.

**Green Bay, Wis.**—The C. Reiss Coal Co. have just had completed an additional 350-ft. dock. With the improvements, the coal dock is put in a class with the largest in the Northwest.

**Birmingham, Ala.**—A corporation is being formed to lease the right to handle the gas from the byproduct coke ovens of the Woodward Iron Co., at Woodward, and after qualifying the product furnish it for heating, cooking and lighting purposes to the people of Bessemer and other places within a radius of five or eight miles of Woodward. The Tennessee Coal, Iron & R.R. Co. uses its gas from its big byproduct plant at its several furnaces and at a big power plant nearby. The Woodward people have more gas than they can use themselves.

**Newcastle, England**—An improved type of coal-carrying vessel has just been launched at Blyth, Newcastle, Eng., which, in the opinion of experts, will begin a new era in the building of cargo ships. The vessel is constructed on what is known as the "arch" principle, which is claimed offers decided advantages over boats of the ordinary type. It is asserted to be the fastest collier built, and will be used for coaling purposes in connection with the British fleet. Smaller capital outlay, cheaper maintenance and increased rate of speed are among the favorable features claimed for the vessel.

## New Incorporations

**Charleston, W. Va.**—A charter has been issued to the Tempastas Oil Co., of Mexico, with principal offices in Bridgeford, Penn., to develop mineral land in Mexico, West Virginia and elsewhere. The authorized capital is $20,000.

**Ogden, Utah**—Incorporation papers for the Lion Coal Co., a local corporation, were filed with the county clerk Sept. 19. The company has control of approximately 700 acres of valuable coal land in the heart of the Rock Spring district. According to the incorporation papers, the company is capitalized at $1,000,000. Mining machinery has been ordered, and the shipment of coal will start about Oct. 1.

**Dover, Del.**—Articles of incorporation were filed here Sept. 27 for the Climax Coal Co., Somerset, Penn., with a capital stock of $50,000, to acquire lands for the development of coal and to mine, ship, sell, convey, transport and market coal, coke, oil, etc.

**Washington, Penn.**—The Grayson Oil Co. Mine produce, purchase and sell minerals and ores, natural gas, coal and petroleum. The principal office is in Pittsburg. Capital stock, $50,000.

**Dover, Del.**—Articles of incorporation were filed here Sept. 21 for the Wilson Coal Land Co., of Indiana, Penn., to acquire by purchase or otherwise coal lands and mineral rights in western Pennsylvania. The capital stock is $500,000.

**Green Top, Mo.**—Articles of incorporation have been filed at Jefferson City for the Moonlight Coal Co. Capital stock is $2100; to mine and sell coal, etc.

**Fairmont, W. Va.**—The Excelsior West Virginia Colliery Co., of Fairmont, W. Va., has been incorporated with $2,000,000 capital stock. The company contemplates the purchase of property in southern West Virginia and details will be announced later.

**Phoenix, Ariz.**—A charter has been granted to the Sonora Exploration & Metals Co., of Phoenix. Capital, $1,500,000; to mine coal and other minerals.

**Indian Springs, Ind.**—A charter has been granted to the Wilson Coal & Clay Co., of Indian Springs, Ind. Capital stock, $10,000.

**Phoenix, Ariz.**—A charter has been granted to the China Hill Mining Co., of Phoenix. Capital, $250,000. J. T. Crawford, of San Francisco, Calif., heads the Board of Directors; to deal in and develop coal and other lands.

**Conneautsville, Penn.**—The Eckels Light, Heat & Power Co. Capital, $15,000. Incorporators, C. F. Eckels, Conneautsville, C. P. Paisley, Wilkinsburg, and H. C. Glass, Kansas City.

**Lynchburg, Va.**—Hill Mining & Lumber Co., Lynchburg, Va., was incorporated with $50,000 capital stock to develop mineral and timber property.

**Albany, N. Y.**—Certificate of incorporation of the Knickerbocker Fuel Co., of Hemstead, has been filed. $100,000. William F. Purdy, of Brooklyn, Pierre M. and Albert W. Brown, of Hemstead, and Alfred M. Schaffer, of New York City, are the incorporators.

**Curwensville, Penn.** — Curwensville, Penn., is boasting of a new coal company, of which Capt. I. B. Norris, of that place, Fred Pilkington, of Grampton, M. J. Kelly, of Clearfield and Mr. Ellery, of New York, are the promoters.

**Clearfield, Penn.**—Application will be made to the Governor of Pennsylvania on the 4th day of October next, by John Dimeling, Fred G. Betts and R. M. Haney, Janesville Coal Co.....

**Ages Ridge, Ky.**—Ages Ridge Coal Co. is the title of a concern being organized for the purpose of taking over eight hundred acres of coal land in Harland County, Ky., for operation purposes. The property has already been opened and men are at work installing the equipment.

**Philadelphia, Penn.** — Advices from Philadelphia state that bankers there are arranging a consolidation of a number of local coal distributing concerns under the name of G. B. Newton Co., with a capital of about $4,400,000. Samuel B. Crowell will be president. An issue of first preferred 7 per cent. stock to be sold for cash has been underwritten by Brown Bros. & Co., Cassatt & Co., and Montgomery, Clothier & Tyler. It is said that the second preferred stock, some cash and part of authorized common stock will go to coal concerns taken into the merger.

## Industrial News

**Pittsburgh, Penn.** — Consolidation of several small railroads in southwestern Pennsylvania, whose stock is owned or controlled by the Baltimore & Ohio R.R., was consummated here Sept. 25, at a meeting of the various railroad heads.

**Pittsburgh, Penn.**—The United States Coal Co. has acquired 2300 acres of land in the Kemmer district, Wyoming, underlaid with deep veins of high-grade steam coal. The company has placed an order with the Ottumwa Box Car Loading Co. for the equipment of the mine, which will be ready for operation by Oct. 1.

**Bicknell Ind.** — Dr. Asbury, of Clay City, has secured options on more coal lands for the American Coal Co. He informs us that the drilling has been completed, the location for the new mine site has been selected, that Pres. Zoller has returned from his summer vacation in Michigan to take up the work of opening the mine.

**Moundsville, W. Va.**—Wheeling's Center Coal Co. has transferred to the Wheeling Steel & Iron Co. a large tract of coal in Union District, a part of the field of 2500 acres owned by the Wheeling's Center Coal Co. The tract adjoins the present mine workings of the Wheeling Steel & Iron Co., and will furnish fuel for its plant being worked through the old mine. The Wheeling's Center Coal Co. is owned by Uniontown people. Attorney James T. Miller, of this city, is secretary and treasurer. John T. Robinson, of Uniontown, is the president.

**Philadelphia, Penn.**—The Taylor Iron & Steel Co. announces the acquisition of the Wm. Wharton, Jr., & Co., Inc., of Philadelphia, Penn., with works at Philadelphia and Jenkintown, Penn., and its subsidiary corporation, the Philadelphia Roll & Machine Co.

The Taylor Co. and the Wharton Co. have both had a successful history of more than 50 years. During the past 18 years the business of each company has been largely supplemental to the other in the manufacture and application of manganese steel.

# Coal Trade Reviews

**Current Prices of Coal and Coke and Market Conditions in the Important Centers**

## General Review

The coal markets in all parts of the country are in a decidedly feverish and unsettled condition. The demand is urgent, and buyers are appearing in the mining regions in the hope of being able to pick up some loose tonnages.

There is little change in the anthracite situation. The mines are working under high pressure, and were it not for the petty strikes, insufficiency of labor and inadequate car supply, the current month would see new production records established. The large producers claim to have the shortage well in hand, but the continual rumors of a possible famine keep the market tense.

In the Eastern bituminous trade, there is detention with practically all shippers. The car shortage on the coal roads is so pronounced, that operators can make no promises ahead and are asking two to three weeks' notice on orders. Most of the better grade West Virginia fuels are still going into the line and Western trade, and will continue so until the Eastern demand becomes sufficiently active to bid up prices. Companies are instructing salesmen to accept no more orders and many are being pushed to take care of their current contracts. Quotations at some points are higher than during the suspension early in the spring.

Mines in the Pittsburgh district are under pressure to get out every ton possible for the Lake trade, and production there is well up to the limit of the car and labor supply. The local demand has improved materially, and prices have stiffened quite sharply all along the line. At Buffalo, the market is so erratic that it is difficult to quote. Fictitious prices are being named to quiet the demand, but even these are occasionally accepted.

The requisitions in Ohio are steadily increasing, while the car situation is growing worse, and shippers are unable to fill all the orders received. Prices on all grades advanced Oct. 1, but new quotations were not generally held, with one or two exceptions. The new prices are held subject to change without notice, and a further increase is anticipated Oct. 15. Cargoes and bunkers at the West Virginia coast terminals are moving rapidly, and shippers have no trouble in disposing of any free coal.

In the Middle West the market continues to stiffen, and some operators are several weeks behind on orders while buyers are noticeably anxious.

## Boston, Mass.

The week has shown some significant developments in bituminous. There is now detention with practically all the shippers at Hampton Roads, and the shortage of cars has become so marked on the lines into Philadelphia and New York that the producers are making no promises ahead and are asking from two to three weeks' notice in order to have coal available for loading.

On Pocahontas and New River some fancy prices are heard, up to $3.25 f.o.b. having been mentioned, but so far it is apparent that these quotations are not for any considerable tonnage in cargo lots but are only on small amounts that shippers buy of each other in order to save detention to vessels they are under obligation to load. The bulk of the better West Virginia coals are still moving West and receipts here are likely to be small until a sufficiently active demand appears here that will bid coal away from the line and Western trades.

The demand for transportation is quiet, due largely to the fear of congestion at the terminals at both ends, but rates are strong at 90c.@$1. At the present time, every vessel discharging at the B. & M. R.R., Mystic Wharf, Boston, is on demurrage, and no relief in the shape of adequate car service is in sight.

There is little new in anthracite. Everyone is marking time, and dealers are busy explaining why they can make deliveries of only a ton or two at a time. One of the operating, companies that has done fairly well for this market is now temporarily out of business on account of a local strike among its miners, and that only serves to increase the general anxiety.

Wholesale quotations are about as follows:

| | |
|---|---|
| Clearfields, f.o.b. mine | $1.20@1.45 |
| Clearfields, f.o.b. Philadelphia | 2.45@2.60 |
| Cambrias, f.o.b. mine | 1.30@1.65 |
| Cambrias, f.o.b. Philadelphia | 2.55@2.90 |
| Georges Creek, f.o.b. Philadelphia | 2.77@2.87 |
| Pocahontas, New River f.o.b. Hampton Roads | 2.90@3.25 |
| Pocahontas, New River on cars Boston | 4.10@4.20 |
| Pocahontas, New River on cars Providence | 4.00@4.10 |

## New York

*Bituminous*—That there is a decidedly tense feeling in the New York soft-coal market is no longer to be questioned. The heavy demand at this period of the year is almost unprecedented in the history of the trade at this point, and in view of the meagre shipments, due to the lack of adequate equipment on the railroads, there is every prospect that the situation will be a serious one when winter arrives. On the other hand, consumers are thoroughly alive to the possibility of a shortage, and are making every effort to accumulate heavy stocks.

Buyers from New England are seeking supplies at this point as well as in the mining regions, but appear unwilling to meet the higher price level in effect. Railroads are buying heavily and stocks here are probably less than 25 per cent. of those on hand at this time last year.

Prices have experienced further slight advances during the week, and are ruling firm on all grades as follows:

| | |
|---|---|
| West Virginia, steam | $2.70@2.80 |
| Ordinary grades, Pennsylvania | 2.80@2.75 |
| Fair grades, Pennsylvania | 2.75@2.85 |
| Good grades, Pennsylvania | 2.90@3.00 |
| Best Miller, Pennsylvania | 3.05@3.15 |
| Georges Creek | 3.30 |

*Anthracite*—The large producing companies continue to assure the public that they have the hard-coal shortage well in hand, and there is no occasion for any alarm over the situation. They state further that the payment of the high premiums, now being asked the consumer, is entirely unnecessary, and, while the shortage may cause some trivial inconvenience, they are emphatic in the belief that it will result in no actual suffering.

The shortage in the prepared sizes remains unchanged, with the smaller grades rather long in supply. The mines are being pushed to the utmost, but the production is curtailed slightly, although not seriously, by the lack of sufficient labor and the inadequate car supply.

Prices are ruling hard and firm as follows:

| | Upper Ports | Lower Ports |
|---|---|---|
| Broken | $5.00 | $4.50 @ 5.00 |
| Egg | 5.25 | 5.50 @ 6.40 |
| Stove | 5.25 | 5.50 @ 6.40 |
| Nut | 5.50 | 5.50 @ 6.40 |
| Pea | 3.50 | 3.35 @ 3.75 |
| Buckwheat | 2.75 | 2.25 @ 2.50 |
| Rice | 2.25 | 1.95 @ 2.05 |
| Barley | 1.75 | 1.60 @ 1.70 |

## Pittsburgh, Penn.

*Bituminous*—Local demand for coal has improved materially, and with strong pressure to get out every ton possible for the Lake trade mines are running as full as they can with the supply of labor and cars. Prices have stiffened quite sharply all along the line and mine-run and screened coal are quotable about 5c. higher, and slack 10c. We quote: Mine-run and nut, $1.10@1.15; ¾-in., $1.30;

1¼-in., $1.40; slack, 70@80c. per ton at mine, Pittsburgh district.

*Connellsville Coke*—The market has been active on contract, with slightly better prices, and quotations on prompt coke have advanced sharply. All offerings of prompt furnace coke have been quickly absorbed, presumably by furnaces experiencing or fearing a shortage of deliveries on their contracts. The offerings, however, are light. It is quite certain that the Connellsville region is producing every ton of coke it can with the supply of labor available, and as additional furnaces blow in an acute scarcity may develop.

This is without considering the possibility of a serious car shortage. With the advent of bad weather the car supply will naturally grow worse, while at the same time it is believed that the labor supply will increase with the cessation of important construction work on highways and railroads. It remains to be seen which way the balance will go as to the supply of coke.

Following contracts recently made by the Youngstown Sheet & Tube Co. for about 75,000 tons of furnace coke a month over the first half of the new year at $2.35 and $2.40 some small contracts have been closed at $2.50, and this is the minimum for that delivery, if it can be done at all. Prompt coke in the past week has sold at $2.65 and $2.75 and the latter is now the minimum, while operators will hardly sell at any price over the fourth quarter. Foundry coke has advanced sharply, and more than furnace coke by reason of the particular scarcity of labor for forking box cars in which the foundry grade must be shipped. We quote: Prompt furnace, $2.75@2.85; first half contracts, $2.50@2.65; prompt foundry, $3@3.25; contract foundry, $2.75@3, per ton at ovens.

The *Courier* reports production in the Connellsville and lower Connellsville region in the week ending Sept. 21 at 373,631 tons, an increase of 1000 tons, and shipments at 4004 cars to Pittsburgh, 6167 cars to points west and 834 cars to points east, a total of 11,005 cars, a decrease of 23 cars.

## Philadelphia, Penn.

The touch of cool weather earlier in the week had the effect of causing additional troubles for the retail dealers here. All sizes were asked for with stove and pea leaders. As a matter of fact, pea coal in this locality bids fair to be a keen rival for stove the coming winter. This city has always used considerable of this size for furnaces, and many of them are equipped with grate bars to accommodate the small coal. While it is not now difficult to secure pea, every day will make matters tighter on this size. It is understood that the large companies have considerable stocks of the small coals, pea, buckwheat and rice and this is probably the cause of the numerous reports to the effect that there are large quantities of coal being kept from the market, so that higher prices can be asked when the winter season is on. It is almost safe to say that every pound of the prepared sizes are being sent to market. Investigations, conventions or all the numerous meetings by the so called retail associations will not increase the mining of coal, which is being pushed to the limit. At the present time, there is more fuel being produced than at any time in the history of the trade, and the operators are doing their best to meet the existing conditions.

The bituminous market continues in about the same condition as reported a week ago. The demand is good, and prices still continue to be quoted well above the mark of two or three months ago, and are constantly improving. It is understood that inquiries are being received by quite a number of bituminous concerns from users of anthracite.

## Baltimore, Md.

Many of the larger companies here are issuing notices to their salesmen not to accept any more orders until further notified, the market already being fairly glutted with business. Practically every operator is up to his neck with orders, with little or no possibility of taking care of any additional business. It has been years since the local trade has witnessed such activity as is now apparent on every hand.

One of the largest coal companies in Baltimore, stopped taking orders two weeks ago, and stated that no more business would be accepted for some time to come. This company is having its hands full taking care of existing contracts, and its officials decided to decline all further orders until the situation eased up somewhat. Other concerns are taking similar measures.

Spot business is practically going begging, and the few companies that have cared to bid for it have received their own prices. The price level was even higher during the week than it was in March and April, when the English strike was on and there was a threatened walkout in America. No coal was sold under $1.15, and consumers who had run short willingly paid as high as $1.25 or better. The greatest demand appeared to be for the low grades.

The car situation, so far as the Western Maryland is concerned, has not improved much. The movement over this line is backward, although the officials are making every effort to better it.

The anthracite dealers in Baltimore have decided to advance the prices 25c. per ton. This action was taken at a meeting of the Baltimore Coal Exchange, held during the week.

## Buffalo, N. Y.

So many bituminous prices are being made that one hardly knows what coal is generally selling for. Besides that, there still comes from Pittsburgh the report that fictitious prices continue there, in order to stave off a demand that is not wanted. A Buffalo jobber reports doing the same thing lately and states that his high price was accepted.

There is much complaint of car shortage, some sections reporting that they are badly handicapped at times on that account. The shipper who is confined to gondola cars is not able to do much; the roads do not pretend to save such cars for coal, as they are needed for structural iron, and the shipper who gets any at all feels that he has been especially fortunate. There is a steady stream of Canadian dealers coming here begging for coal. They mostly want anthracite, but are often short of bituminous also.

Bituminous prices are stiffer every week, but they do not really advance to any extent. If a dealer gets 15c. over good summer prices he is doing well; mostly he does not. The real gain is in the elimination of all price cutting and in the greatly increased business. There is also much less complaint about the quality, so that the shipper is vastly better off than he has been of late.

Quotations of bituminous remain strong at $2.60 for three-quarter, $2.50 for mine-run and $2.15 for slack, Pittsburgh quality, with Allegheny Valley about 25c. lower, except slack, which is up to other slack prices. Coke is even stronger than coal and is quoted at $4.85 for best Connellsville foundry and promising to go higher soon.

The anthracite market is feverish, being much aggravated by reports that prices will soon go up to fairly prohibitive figures. While there seems to be no reason for such stories, unless from local combinations, they are a source of much actual distress at shipping centers.

Anthracite shipments by Lake keep up well, being for the week 187,000 tons, nearly all to Chicago, Duluth and Milwaukee.

## Columbus, Ohio

With the car situation growing worse as the winter approaches, and with a better demand in all grades, operators and shippers are becoming unable to fill all orders received. Every thing now hinges on the car supply and that is the ruling factor in fixing prices. Retailers in every section are clamoring for coal and every effort is being made to stock up but they are unsuccessful because of the lack of transportation facilities.

Prices on practically all grades were advanced Oct. 1, but the $2 level was not reached excepting in the Pomeroy Bend district; in other sections the price for

domestic lump was advanced to $1.75. In the circulars announcing the advance operators called attention to the statement that the prices were subject to change without notice with the expectation of a still further increase about Oct. 15. One of the larger producing concerns is refusing to accept any orders for delivery after that date at the prevailing circular.

The greatest demand is from the domestic trade. Retailers are asking for immediate shipments as they are being rushed with orders from consumers. The small stocks which were accumulated earlier in the season have been exhausted and strenuous efforts are being made to cover. There is a good demand for the fancy grades and as a result consumers are stocking up with Pocahontas and splints.

The steam business is another firm department of the trade. Manufacturing concerns continue using more fuel and many are asking for larger shipments in order to accumulate stocks against emergencies. Railroad requisitions are increasing also and this is making a good demand in the Eastern Ohio territory.

Production has been curtailed below the 50 per cent. mark during the week because of the few cars. In Eastern Ohio the output is estimated at 55 per cent. of normal and the Hocking Valley is at 45 per cent. In the Pomeroy Bend field the production is said to be only about 30 per cent. of normal; this field is on the K. & M. R.R. which is the poorest supplied section in the state.

Quotations in the Ohio fields are:

| | Hocking | Pittsburgh | Pomeroy | Kanawha |
|---|---|---|---|---|
| Domestic lump | $1.75 | | $2.00 | $1.75 |
| 4-in. | 1.55 | $1.20 | 1.75 | 1.55 |
| Nut | 1.25 | | 1.50 | |
| Mine-run | 1.30 | 1.05 | 1.50 | 1.30 |
| Nut, pea and slack | 0.70 | | 1.00 | 0.60 |
| Coarse slack | 0.60 | 0.70 | 0.85 | 0.50 |

## Hampton Roads, Va.

While there has not been any real excitement at Hampton Roads during the past week, cargoes and bunkers have been loading, and moving in rapid succession. Shippers are finding no difficulty in disposing of all their free coal.

It appears as though the Virginian Railway piers will enjoy the heaviest month of the season. On Wednesday last, this pier had dumped within two or three thousand tons of the total dumping at the C. & O. Ry. piers, at Newport News. This is the first time in the history of the port that the dumping of these two piers, near the end of the month, have been so near together.

There have been no changes in the strike situation in the Kanawha district on the C. & O. Ry. Little coal is being loaded in that section at the present time; the martial zone extends over three-fourths of the district.

Shippers who are in the market for vessels are finding rates higher than ever before this season. This is felt more in the Mediterranean tonnage than elsewhere. The large amount of grain moving from Northern ports and cotton booked from Southern ports, which freights carry a premium rate, is said to be the cause of the high prices asked for coal cargoes from Hampton Roads.

## Louisville, Ky.

Both scarcity of labor and shortage of cars are interfering with Kentucky mining operations to some extent. The former condition, however, is not as serious as the latter. All of the companies are able to do effective work with the forces on hand, and the chief drawback is the inability of railroads to supply enough equipment. It now appears probable that the shortage will become even more marked in the near future. The roads are concentrating their efforts on the movement of the Western grain crops, which is the cause for many loaded coal cars being side-tracked.

## Knoxville, Tenn.

With practically all the blast furnaces in the South blowing in, and with general industrial and commercial conditions constantly improving, the companies in this field are having a good demand, at satisfactory prices, which are steadily becoming stronger, owing to the car shortage.

At a recent informal meeting of operators, held in Knoxville, it was found that the car supply at the different mines was running from 40 to 60 per cent. below normal. The labor shortage is also reported at different mines, and the operators, with plenty of business and satisfactory prices, find themselves in an unsatisfactory situation.

It is predicted that within 60 days, all of the coke ovens in the Virginia field will be in operation. This will cause a more active steam market in the Carolinas and will have a beneficial effect upon the Kentucky-Tennessee field. Alabama steel companies will also withdraw considerable tonnage for coking, which will also help this district.

## Detroit, Mich.

*Anthracite*—Detroit faces what will probably be the worst anthracite famine in her history. It is freely predicted that this product will reach $12 a ton before the winter ends. It is roughly estimated that the city is short at least 75 per cent. of its usual reserve at this time of the year.

It is stated that there is no cause for a panicky feeling, and that there has been no increase made in the price of hard coal by the producing companies. At the same time, it will be necessary for consumers of this grade to be as economical as possible.

The anthracite shortage has boosted the price of coke. Solvay is quoted from $6.25 to $6.50 by all dealers.

*Bituminous* — The product is very scarce, and the situation is becoming more acute day by day. There is no possible chance for any of the big consumers to buy in large quantites.

Several heavy orders have been placed and it was expected that they would be filled, but the sudden cold snap of the last few days, has made conditions quite serious. Some are blaming this to a car shortage which exists in West Virginia. Cars cannot be placed at the mines as promptly as they should be. A snow flurry now would be disastrous, both to the railroads and the operators.

The prices are higher as follows:

| | W.Va. Splint | Pocahontas | Pittsburgh | Hocking |
|---|---|---|---|---|
| Lump and egg | $1.75 | $2.55 | | 1.75 |
| ¾ lump | 1.30 | | $1.35 | 1.40 |
| Mine-run | 1.15 | 1.35 | 1.20 | 0.25 |
| Slack | 0.90 | 1.10 | 0.90 | 0.90 |

## Chicago

Chicago dealers report that quotations are exceptionally satisfactory. Labor is scarce and high prices are being paid to all classes of workmen. There is an unusual demand for coke and it is expected there will be an advance in the price of gas-house soon. Dealers continue to complain about a shortage of cars.

The prevailing prices at Chicago are:

| | |
|---|---|
| *Sullivan County* | |
| 4-in. lump | $2.47@2.62 |
| Egg | 2.37@2.47 |
| Mine-run | 2.02 |
| Screenings | 1.57@1.62 |
| *Springfield* | |
| Domestic lump | $2.32 |
| Steam lump | 1.97 |
| Mine-run | 1.87 |
| Screenings | 1.27 |
| *Clinton* | |
| Domestic lump | $2.27 |
| Steam lump | 2.12 |
| Mine-run | 1.92 |
| Screenings | 1.52 |
| *West Virginia* | |
| Egg | $4.40@4.55 |
| Mine-run | 3.45@3.65 |

*Coke*—Prices asked for coke are: Connellsville, $5.50; Wise County, $5.25; by-product, egg and stove, $4.85@5; by-product, nut $4.85@5; gashouse, $4.85.

## Minneapolis—St. Paul

The past week has seen little change in the situation here except for a further tightening up in the supply and prices at the head of the Lakes. There is not enough hard coal coming up to take care of what orders are received, to say nothing of accumulating a supply. Orders are taken subject to conditions. The dock companies tell the retailers plainly they are not responsible for the shortage and cannot promise delivery. The buyer has to go the rounds and generally meets with but poor success.

Country buying during the month has not been heavy, as dealers everywhere are stocked up with soft coal and many

are dumping on the ground. The car shortage on some lines in Illinois is so serious that mines are only working one or two days a week.

Prices on Illinois coal are advancing from day to day. Franklin County lump is selling for all the way from $2 to $2.50; egg and No. 1 nut, $2@2.25; special stove, $1.85@2.

Dock smokeless lump or egg is now $5 at the docks, mine-run $3.25, and all-rail smokeless is not obtainable. Price at the mine for the latter is quoted at $2.25, but owing to the car situation and the strike in the West Virginia fields none is coming in.

## St. Louis, Mo.

The market continues to stiffen up on everything excepting Standard, and there is a slight increase in that. Carterville operators are still a couple of weeks behind in shipments, and cars are scarce in that field. Some of the roads in the inner district are badly cramped for equipment, especially the B. & O. and I. C. The Wabash is also feeling the shortage.

There is absolutely no anthracite coming in, and orders taken in June are as yet unfilled. The neglect of this market by the hard-coal operators will cause the consumers to start using coke and smokeless coal, and it is doubtful if anthracite will ever again be in such demand in St. Louis.

There is also a scarcity of coke, especially byproduct. Smokeless is moving in fairly well, and everything indicates that the month of October will be an especially good one as far as prices are concerned, with a curtailed tonnage on account of the lack of equipment.

| | |
|---|---|
| *Franklin County* | |
| Lump and egg | $1.85@2.10 |
| No. 1 nut | 1.60@1.75 |
| No. 2 nut | 1.40@1.50 |
| Screenings | 0.65@0.75 |
| *Carterville* | |
| Lump | $1.85@2.10 |
| Egg | 1.75@2.00 |
| No. 1 nut | 1.35@1.50 |
| No. 2 nut | 1.20@1.30 |
| Screenings | 0.65@0.75 |
| Mine-run | 1.20@1.25 |
| No. 1 washed | 1.85@2.00 |
| No. 2 washed | 1.65@1.75 |
| No. 3 washed | 1.40@1.50 |
| No. 4 washed | 1.15@1.25 |
| No. 5 washed | 0.95@1.00 |
| *Big Muddy* | |
| Lump and egg | $2.35 |

The Franklin County and Carterville coals take a 67c. freight rate to St. Louis, and the Big Muddy a 64c rate.

| | |
|---|---|
| *Trenton* | |
| Lump and egg | $2.15 |
| *Mount Olive* | |
| 6-in. lump | $1.60 |
| 3-in. lump | 1.50 |
| 2-in. lump | 1.40 |
| Egg | 1.50 |
| *Standard* | |
| 6-in. lump | $1.25@1.35 |
| 2-in. lump | 1.10@1.15 |
| Screenings | 0.40@0.50 |
| Mine-run | 0.90@0.95 |

The above coals take a 52c freight rate to St. Louis.

| | |
|---|---|
| Gas house coke | 4.85@5.00 |
| *Smokeless* | |
| Lump | $4.75 |
| Egg | 4.65 |

## Production and Transportation Statistics

### Chesapeake & Ohio Ry.

The following is a comparative statement of the coal and coke traffic over the lines of the C. & O. Ry., for July, 1911-12, and for the 12 months ending June 30, 1912, in short tons:

| | July | | |
|---|---|---|---|
| *Destination* | 1911 | 1912 | 12 months |
| Tidewater | 294,589 | 288,693 | 4,324,397 |
| East | 137,749 | 164,748 | 2,164,960 |
| West | 909,108 | 931,885 | 11,105,871 |
| Total | 1,341,444 | 1,385,326 | 17,595,228 |
| Coke | 16,809 | 19,976 | 236,518 |
| *From Connections* | | | |
| Bituminous | 15,076 | 15,541 | 214,703 |
| Anthracite | 2,900 | 789 | 35,228 |

### Pennsylvania Railroad

Statement of coal and coke carried on the P. R.R. Co.'s lines east of Pittsburg and Erie during August and the first eight months with the increase or decrease over the same period last year, in short tons:

| | August | 8 Months | Difference |
|---|---|---|---|
| Anthracite | 927,277 | 6,452,287 | −1,197,409 |
| Bituminous | 4,032,727 | 30,207,895 | +3,332,594 |
| Coke | 1,146,390 | 8,597,730 | +1,635,417 |
| Total | 6,106,394 | 45,257,912 | +3,770,602 |

### Baltimore and Ohio R.R.

The following is a comparative statement of fuel movement over the B. & O. R.R. and affiliated lines for July and August, 1911-12, in short tons:

| | July | | August | |
|---|---|---|---|---|
| | 1911 | 1912 | 1911 | 1912 |
| Coal | 2,378,859 | 2,519,881 | 2,651,848 | 2,919,911 |
| Coke | 286,238 | 368,720 | 347,457 | 409,627 |
| Total | 2,665,097 | 2,888,601 | 2,999,305 | 3,329,538 |

## Foreign Markets

### Great Britain

*Sept. 20*—More satisfactory conditions are in evidence. Tonnage supplies are better, and sellers in a number of cases are in a position to hold out for slightly higher figures. Prices are approximately as follows:

| | |
|---|---|
| Best Welsh Steams | $4.02 @ 4.14 |
| Best Seconds | 3.90 @ 3.96 |
| Seconds | 3.60 @ 3.66 |
| Best Dry Coals | 3.90 |
| Best Monmouthshire | 3.72 |
| Seconds | 3.42 |
| Best Cardiff Smalls | 2.52 @ 2.58 |
| Seconds | 2.46 |

The prices for Cardiff coals are f.o.b. Cardiff, Penarth, or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both exclusive of wharfage, and for cash in 30 days—less 2½%.

*British Exports*—The following is a comparative statement of the British exports for August of the current year and the first eight months of 1911-12:

| | | Eight Months | |
|---|---|---|---|
| | August | 1911 | 1912 |
| Anthracite | 255,260 | 1,544,885 | 1,533,475 |
| Steam | 4,688,550 | 30,445,732 | 28,370,605 |
| Gas | 1,044,002 | 6,825,566 | 6,791,847 |
| Household | 189,420 | 974,102 | 991,688 |
| Other sorts | 280,443 | 2,040,755 | 1,985,249 |
| Totals | 6,457,675 | 41,831,040 | 39,672,864 |
| Coke | 108,948 | 617,294 | 583,034 |
| Patent Fuel | 163,030 | 1,117,783 | 990,258 |
| Coal, Coke, & Pat. Fuel | 6,729,653 | 43,566,117 | 41,246,156 |

## Financial Notes

### Coal Securities

The following table gives the range of various coal securities and dividends paid during the week ending Sept. 27:

Stocks.

| Company | High | Low |
|---|---|---|
| American Coal | 85 | 85 |
| American Coal Prod. | 98 | 98 |
| American Coal Prod. Pref. | 114 | 114 |
| Col. Fuel & Iron | 43¼ | 37½ |
| Consol. Coal of Md. | 102 | 102 |
| Lehigh Valley C. Sales | 260 | 250 |
| Pitts. Coal | 26⅜ | 25 |
| Pitts. Coal Pref. | 98⅞ | 96¼ |
| Pond Creek | 24 | 23½ |
| Reading | 174¼ | 171½ |
| Reading 1st. Pref. | 93¾ | 93¼ |
| Reading 2nd. Pref. | 96⅜ | 96⅛ |
| Va. Iron C. & C. | 66⅝ | 63 |
| Westmoreland Coal | 81 | 81 |

Bonds.

| | | |
|---|---|---|
| Ches. & O. Coal R. 4's | 85 | 85 |
| Col. F. & I. Gen. 5's | 98⅜ | 98⅛ |
| Col. Inds. col. tr. 5's | 85⅛ | 84⅞ |
| Cont'l. Coal 5's | 97⅜ | 97⅛ |
| Erie–Penn. Coal col. 5's | 89½ | 89⅜ |
| Poca. Cons. Coll. 5's | 86 | 86 |
| Tenn. C. I. & R. R. gen 5's | 102 | 102 |
| Reading gen. 4's | 96½ | 96⅜ |
| Va. Iron C. & C. | 96 | 95½ |

Dividends.

| Company | Div. | Period | Payable |
|---|---|---|---|
| Am. Coal Products Pref. | 1¾ | Q | Oct. 15 |
| Leh. Val. C. Sales | 2½ | | Oct. 21 |
| Ohio Fuel Supply | 2 | Q | Oct. 15 |
| Pitts. Coal Pref. | 1¾ | Q. | Oct. 25 |

**Consolidation Coal Co.**—On Aug. 29 this company listed on the New York Stock Exchange $589,000 additional first and refunding 40 year 5% sinking fund bonds, making the total listed to date $14,549,000. Of the new issue, $179,000 will be utilized for improvements and extensions, and $410,000 for the acquisition and improvement of their northern coal lands.

**Colorado Fuel & Iron Co.**—A special meeting has been called for Oct. 19 to extend the company's charter; regular annual meeting will be held Oct. 21. At the latter meeting the proposition to recapitalize the company will be taken up and probably disposed of. It is stated that the new financial plan will be exceptionally beneficial to both preferred and common stockholders. It will probably consist of a rearrangement of the bonded indebtedness.

**Cumberland Coal Corporation**—This corporation having acquired various obligations of the Carolina, Clinchfield & Ohio Ry. is to transfer certain of these, and stocks of various subsidiary companies, to the railway as consideration for the issuance to the corporation of $5,000,000 of common stock of the railway, bringing the outstanding common up to $25,000,000. The railway stock has been readjusted so as to consist of $15,000,000 authorized preferred with $10,000,000 outstanding and $5,000,000 unissued and $25,000,000 common stock.

**Clinchfield Coal Corporation**—The Clinchfield Syndicate, formed under agreement of Dec. 1, 1910, to purchase from the Cumberland Corporation all the capital stock of the Clinchfield Coal Corporation and certain allied companies, expired on July 1. Subscribers were at this time allotted $1500 common stock, voting trust certificates of the Clinchfield Corporation for each $1000 of their subscriptions and were permitted till Aug. 1, to subscribe at par, less a commission of 5%, for $2,500,000 of the $3,000,000 7% preferred stock, to the extent of one share for every six shares of common stock received by them respectively.

# Prices of Mining Supplies

**Current Prevailing Prices of Mining Commodities Compiled as a Convenient Reference for Buyers**

### The Markets in General

A record-breaking volume of business is being transacted by manufacturers and mercantile concerns. The total volume of business exceeds that during the latter part of 1906 and early in 1907, but is not causing anything like the congestion noted at that time, for facilities for the transaction of business and the manufacture of commodities have been greatly increased. The prosperity seems to be more general than at that time and without any sign of a boom.

From every state in the Union and from practically every trade and branch of mercantile activity the response is the same. The activity incident to the construction of new plants, new buildings, building of permanent works for municipalities and governments is only limited by the shortage of labor. These conditions are the result of several factors, chief among which may be mentioned the enormous crops which will be harvested this year, the general employment of labor which in turn brings its demand for more commodities and is the result of too little business activity in the last four years. All transportation facilities of the country are being used to the utmost limits of capacity. A shortage of freight cars already exists and this will grow more serious during the next fortnight. Coastwise and transatlantic shipping is especially active and freight rates have advanced rapidly.

The iron and steel industry is flourishing as perhaps never before. This activity is not confined alone to the United States but is world-wide.

### Labor

Fully 50 000 additional men could find employment in and around the Pittsburgh district. Similar conditions, although of a lesser degree, prevail in other industrial centers. Contract labor on the highways and on outside construction work commands $2 to $2.25 per day, and this is the kind of work the emigrants naturally turn to as many of them reach the United States through the port of New York. Fewer laborers are coming to this country from Europe, because better conditions prevail at home. In a widely quoted interview the chairman of the Board of Directors of the U. S. Steel Corporation states that he never saw conditions in Europe so prosperous or the demand for laborers so keen.

Immigration figures from Jan. 1 to Sept. 20 of the present year numbered 740,483, while 279,000 aliens returned, making a net gain of less than half a million. In the same period in 1911 575,000 emigrants arrived and in 1910 821,000. The high record for immigration was apparently set in 1907, when in the first 8 months and 20 days 1,035,000 aliens reached American ports.

## IRON AND STEEL PRODUCTS

The steel mills of the country are turning out the largest tonnage in their history and in spite of this orders accumulate faster than shipments can be made, and stocks accumulated during a period of less activity are being rapidly depleted. By the first of the year the enormous stocks of iron which were accumulated at southern points will be entirely disposed of. From that time on consumers will have to rely on the iron as it is manufactured. In the line of finished steel the activity is even greater. Large bonuses have been offered for structural steel shapes to be delivered in 90 days, but mills were unable to accept the business for delivery before next March. A large consumer of galvanized sheets wished to purchase 1000 tons and although the inquiry was sent out to eight different mills, only two responded and these quoted on black sheets.

**Old Material**—The market is stronger in all centers and in many of them the business being booked is large. In the West the shortage of freight cars is hampering the movement of railroad scrap in the market, but scrap is coming out in large quantities. Eastern prices have not advanced with the same rapidity that has been noted in the West, and quotations per gross ton New York are as follows:

| | |
|---|---|
| Heavy-melting steel scrap.. | $12.00@12.50 |
| No. 1 railroad wrought..... | 13.75@14.25 |
| Pipes and flues..... | 11.50@12.00 |
| Cast borings..... | 7.75@ 8.00 |
| Machinery cast broken up.. | 11.50@12.00 |
| Stove plate..... | 9.00@ 9.25 |
| Malleable castings..... | 10.00@10.50 |
| Wrought turnings..... | 8.75@ 9.00 |

In Chicago heavy-melting steel scrap is in relatively better demand than cast scrap, but there is a fair inquiry for all classes. Quotations are as follows:

| | Per gross ton |
|---|---|
| Heavy melting steel scrap.. | $12.75@13.25 |
| | Per net ton |
| No. 1 railroad wrought..... | $13.00@13.50 |
| No. 2 railroad wrought..... | 12.00@12.50 |
| No. 1 cast scrap..... | 12.75@13.25 |
| Pipes and flues..... | 10.00@10.50 |
| Agricultural malleable..... | 11.00@11.50 |
| Railroad malleable..... | 12.50@13.00 |

In Pittsburgh notwithstanding the embargo at the plant of the Western Steel Co. prices continue to advance, and the market is fairly strong. Quotations in Pittsburgh per gross ton are as follows:

| | |
|---|---|
| Rerolling rails..... ..... | $15.00@15.25 |
| No. 1 cast scrap..... | 13.25@13.50 |
| Heavy-melting steel scrap.. | 14.25@14.50 |
| Old car wheels..... | 14.00@14.25 |
| Machine-shop turnings..... | 11.00@11.25 |
| Stove plate..... | 10.25@10.50 |
| Grate bars..... | 9.75@10.00 |

**Roofing, Corrugated**—Further advances have been made in the price of galvanized sheets, but the extras for corrugation are unchanged at 5c. per 100 lb. for corrugating in 2- 2½- 3- and 5-in. corrugation. Painting, gages from 25 to 28, is 10c. per 100 lb. Deliveries on sheets are not at all satisfactory and consumers who buy large lots from the mills are obliged to wait several months before deliveries are made. Stocks accumulated early in the year have been largely depleted, and the demand at present is greater than the manufacture.

The following table gives the price of sheets in carload lots f.o.b. the Pittsburgh district:

| | Cents per lb. | |
|---|---|---|
| | Black | Galvanized |
| Nos 10 to 12..... | 1.80 | 2.30 |
| Nos. 13 and 14..... | 1.85 | 2.40 |
| Nos. 15 and 16..... | 1.90 | 2.55 |
| Nos. 17 to 21..... | 1.95 | 2.70 |
| Nos. 22 23 and 24..... | 2.00 | 2.80 |
| Nos. 25 and 26..... | 2.05 | 3.00 |
| No. 27..... | 2.10 | 3.15 |
| No. 28..... | 2.15 | 3.30 |
| No. 29..... | 2.20 | 3.40 |
| No. 30..... | 2.30 | 3.60 |

**Cast-Iron Pipe**—Prices have advanced in the East this month, but in the West and South quotations are unchanged from a month ago. The demand is large, manufacturers having practically no stocks on hand, and as they are obliged to buy iron at a higher cost, there seems to be but little doubt that quotations will again advance. For the present the demand from water works is small and the foundries will be able to catch up on the accumulated orders. Quotations per net ton of 2000 lb. are as follows:

Chicago, 4-in.; $30; 6- to 12-in; $28; larger sizes, $27.

New York, 6-in. ,$23.50@24.

Birmingham, Ala., 4-in., $25; 6- to 8-in.; $22; 10-in. and over, $22.50.

Gas pipe is $1 per ton higher in all markets.

**Steel Rails**—The large purchase of rails made by the leading railways of the country has excited more than usual interest. Northwestern railroads place their orders early in the season and the Great Northern has ordered 40,000 tons in addition.

Other quotations f.o.b. Pittsburgh are as follows: Standard sections 50 to 100 lb. per yd., 1.25c. per lb.; 40 to 50 lb.,1.21c.; 12 lb., 1.25c. Relaying rails of standard sections are $24. In New York relaying rails are $22 to $23. In Chicago carload lots of light rails are quoted as follows: 25 to 45 lb., 1.20 to 1.25c.; 15 to 20 lb., 1.25 to 1.30c.; 12 lb., 1.30 to 1.35c.; 8 lb., 1.35 to 1.45c.

**Steel Mine Timbers**—There has not been any especial activity in mine timbers, but as manufacturers are endeavoring to introduce this on the market shipments are being made promptly. Quotations are slightly irregular at 1.40 to 1.50c. per lb. f.o.b. Pittsburgh.

**Track Supplies**—Railroads have been large purchasers of supplies and prices have advanced slightly for spikes, which are now quoted at $1.80 Pittsburgh. Other quotations are unchanged,

**Bars, Concrete Reinforcing**—A further advance has been made in the price of reinforcing concrete bars. The market is now steady at 1.45c. Pittsburgh to 1.62c. New York for the base price of ¾-in. bars; 5-in. bars are 1.45 to 1.50c. and ½-in. 1.50 to 1.60c. Only one seller in the New York market is able to accept business for November delivery.

**Wire Rope**—Prices continue unchanged. The discount to the larger trade is 42½ and 5% from list for galvanized, and 50 and 5% for bright. The net prices per foot are given on page 33 of the issue of July 6.

**Merchant Pipe**—One of the largest consumers of pipe in the Pittsburgh market wished to purchase eighteen miles of 6-in. pipe and was compelled to place the order with the eastern mills because those in the Pittsburgh district were unable to promise prompt delivery. The largest inquiry ever received for iron pipe came this month, and was for export and includes about 300 miles of 6-in. pipe. This will probably be divided between American and German manufacturers.

There has been a slight change in the quotations and discounts which are given in the following table.

| | Black | Galvanized |
|---|---|---|
| ⅜- to 3½-in. butt welded.. | 79% | 71% |
| 4- to 6-in. lap welded..... | 78% | 70% |
| 7- to 12-in. lap welded.... | 76% | 66% |

**Nails**—Although prices are unchanged, the market is exceptionally strong. The chief difficulty the makers of nails have to contend with at present is the shortage of cars, but perhaps if the supply of cars were ample there would be a shortage of stock. As shipments now exceed the daily manufacture and stocks have already been drawn on heavily, it will not be many weeks before they are much depleted. Quotations are unchanged from last month.

**Lag Screws**—A decided improvement has been noted in the demand but the market is steady, although firm. Lag screws are now sold at discount of 80% from list. A table of net prices will be found on page 34 of the July 6th issue.

**Spiral Riveted Pipe**—Some large orders have recently been taken for domestic consumption and it is expected that discounts will be revised in the near future. Net prices were given on page 34 of the issue of July 6th.

**Piling, Sheet Steel**—Higher prices are named and 1.50c. Pittsburgh is now the bottom figure. Deliveries are much better in any other lines of finished steel and shipments are generally made in two weeks after receipt of specifications.

**Wire**—The large stocks of wire in the hands of manufacturers and also jobbers are being rapidly depleted. The consumption is enormous. Prices will probably advance within the next fortnight. For the present 1.75 is quoted for plain barbed wire and 2.75 for galvanized, f.o.b. Pittsburgh. Painted wire is 1.88 and galvanized 2.18 in Chicago. These prices are per 100 lbs.

## MILL SUPPLIES

**Shafting**—The demand for shafting has never been so great as at present. Not only are the automobile manufacturers using more of it than ever before, but everyother user is buying large quantities. Discounts have been changed, prices are very steady at the advanced quotations. In carload lots, the new discount for immediate shipment is 62% from list; for less than carload lots 57% from list. Deliveries are made of carload lots in base territory, and equalized in other territories. The following net prices per foot are based on a discount of 57%.

COLD-ROLLED SHAFTING

| Diameter, inches | Cents per foot |
|---|---|
| ¾ | 3.85 |
| 1 | 6.30 |
| 1¼ | 9.90 |
| 1½ | 12.90 |
| 1¾ | 17.50 |
| 2 | 23.00 |
| 2¼ | 29.00 |
| 2½ | 36.00 |
| 2¾ | 43.50 |
| 3 | 51.70 |
| 3½ | 76.00 |

**Belting**—Large quantities of belting have been purchased and now orders are frequent. Discounts are without change as follows:

Leather belting, extra heavy, 50 to 50 and 5%; heavy, 50 and 10 and 5 to 60%; medium, 60 and 10 to 60 and 10 and 5%; light, 60 and 10 and 10 to 70%; Standard, 70 to 70 and 10%.

Rubber belting, best grades, 40 and 10%. Standard, 50 and 10% to 60%. Competitive grades are 60, 10 and 10% to 70%.

The price of rubber belting is, as stated, unchanged from last month. The net prices may be found on page 153 of the issue of Sept. 5.

## MISCELLANEOUS

**Petroleum Products**—The Standard Oil Co., and the various constituent companies related to it, had in storage the first of this year, 100,000,000 bbls. of petroleum products. This stock has been largely reduced during the year. Quotations are steady, kerosene being held at 8c. per gallon and gasoline at 19¾c.

**Copper Wire**—Consumers of copper wire have purchased more freely in the last month than in any other month this year. This is unusual, for generally all the business in wire is placed before August 1st. Much of this material was ordered for Winter delivery. Quotations are steady and without change, with 18¾ to 19c. being quoted as basis.

**Rope**—Higher quotations have again been named for rope. This is in line with all hemp and jute products. The demand for these commodities has increased wonderfully in the last twelve months. Manilla rope of the first grade is quoted at 12c. per lb., second grade 11c. per lb. and hardware grade 9c. per lb.

**Paper**—Higher prices will probably be named for paper within the next month. The present market is strong and quotations are repeated from last month, as follows:

| | Per roll of 500 Sq.Ft. |
|---|---|
| Rosin sized sheathing, 20 lb. | 28c. |
| Rosin sized sheathing, 30 lb. | 43c. |
| Rosin sized sheathing, 40 lb. | 58c. |

ROOFING, RUBBER

| | Per Roll of 108 Sq.Ft. |
|---|---|
| 1 ply—35 lb. | $0.90 |
| 2 ply—45 lb. | 1.10 |
| 3 ply—55 lb. | 1.30 |

Tarred felt is $1.45 per 100 lb. in 1, 2 and 3 ply. Slaters' felt is 60c. per roll.

**Portland Cement**—Makers of cement advanced prices steadily and 90c. per bbl. in bulk at the mills is the general quotation. This is equivalent to a price of 1.58 in New York, less 40c. for bags returned. The largest inquiry received for cement this year was from the Isthmian Canal Commission for 1,000,000 bbls. This excited little interest in the cement trade and the largest maker of cement, who had the last contract at about 60c. per bbl. in bulk at the mill, refused to bid. The lowest bid received from any concern was 95c. per bbl. in bulk at the mill. Cement manufacturers are expected to make another advance in quotation before the first of the year.

**Brattice Cloth**—Prices have advanced rapidly within the last few days. For the last few months the market has advanced almost continuously. The reason for this is found in the increasing use of jute cloth of all shapes and descriptions, not only burlap but as a base for patent roofing and to a lesser degree the brattice cloth itself. The jute crop is large, probably above normal, but in spite of this quotations continue to advance.

**Fire Hose**—Prices of hose are unchanged. The standard grade of underwriters' cotton rubber-lined hose, 2-in. diameter warranted, 350 lb. pressure, is sold in 50-ft. lengths complete with couplings at 65c. per ft. Common hose, 2½-in. diameter, tested to 200 lb. pressure, is 35c. per ft.

**Cotton Waste**—Prices are as follows in bales of 100 to 500 lb.: No. 1 white picked cotton waste, 9¼c. per lb.; No. 3, 7¼c.; No. 1 colored, 5c.; No. 3 colored, 4¼c.

**Packing**—Prices are slightly higher, asbestos wick and rope packing being quoted at 14@15c. per lb. Other grades are unchanged, sheet rubber being 11@13c.; pure gum rubber, 40@45c.; red sheet rubber, 40@50c. Cotton packing is 16@25c.; jute at 3@4c. and Russian 9@10c. per lb.

**Lubricating Oils**—Quotations continue without change, the following figures being named for 5-bbl. lots:

| | Cents per gal. |
|---|---|
| Cylinder, dark | 20@27 |
| Cylinder, steam, refined | 14@22 |
| Neutral oils, filtered: | |
| Stainless white, 32 to 34 gravity | 28@29 |
| Lemons, 33 to 34 gravity | 17@19 |
| Dark, 32 gravity | 15@18 |
| Crank case oil | 15@17 |

Prices are according to test.

**Insulators**—Prices are without change. Glass insulators in lots of more than 1000 and less than 10,000 are sold at the following prices per 1000: Double petticoats, 20 oz., $33; Western Union, $30.25; No. 2 cable, $53.90; No. 4 cable, $210; Muncie type, 7-in., $236.50; No. 3 triple petticoat, 4½-in., $90.75.

**Telegraph Wire**—For lots of fair size, the wire measured in Birmingham wire gage, the prices in cents, per lb., are as follows: "Extra Best Best." Nos. 6 to 9 4⅜c.; Nos. 10 and 11, 4½c.; No. 12, 4⅝c. No. 14, 5⅛c. "Best Best," Nos. 6 to 9 3½c. Nos. 10 and 11 3⅝c. No. 12 3¾c. No. 14, 4c. Actual freight is allowed from Trenton, N. J. where it does not exceed 25c. per 100 lb.

**Merchant Shapes**—Prices have advanced 15c. per 100 lb. for structural shapes from store, New York. The base price now is 3.20c. compared with 2.05c. last month.

Quotations from store, New York, are as follows:

| | Cents per lb. |
|---|---|
| Refined iron: | |
| 1- to 1½-in. round and square | 1.90 |
| 1½- to 4-in.x⅛- to 1-in. | 1.90 |
| 1½ to 4-in.x1⅛- to 5-in. | 2.10 |
| Rods: | |
| 5- and 11/16-in. round and square | 2.20 |
| Angles: | |
| 3x¼-in. and larger, base | 2.20 |
| 3x- 5/16 in. and ⅛-in. | 2.60 |
| 1½ to 2¼x¼-in. | 2.35 |
| 1½ to 2¼x 5/16-in. and thicker | 2.25 |
| 1 to 1¼x 5/16-in. | 2.35 |
| 1 to 1¼x⅛-in. | 2.40 |
| ⅞x⅛-in. | 2.50 |
| ¾x⅛-in. | 2.55 |
| ⅝x⅛-in. | 2.75 |

**Asbestos**—Asbestos building felt and sheating in less than ton lots is 3½c. per lb. for the light, weighing from 6 to 30 lb. per 100 sq.ft.; 4c. per lb. is charged for the heavy, weighing from 45 to 56 lb. per sq.ft.

Millboard is made in standard sheets, 40x40 in., and 41x40 in. It varies in thickness from 1/32 to ⅛ in. and in weight from 2 to 27 lb. per sheet. The net price in 100-lb. lots is 5c. per lb.

# Index of Coal Literature

**Monthly list of the world's best articles on coal and coal mining**

The following is a list of abbreviations used below:
A.E.G.-Ztg. = A.E.G.-Zeitung.
Am. Lab. Legis. Rev. = American Labor Legislation Revue.
Ann. Mines = Annales des Mines.
Ann. Mines Belgique = Annales des Mines de Belgique.
Austral. Min. Stand. = Australian Mining Standard.
Berg-Huttenmänn. Rdsch. = Berg- und Huttenmännische Rundschau.
Bull. Am. Inst. Min. Eng. = Bulletin American Institute of Mining Engineers.
Can. Eng. = Canadian Engineer.
Can. Min. Jl. = Canadian Mining Journal.
Chem. Eng. = Chemical Engineer.
Coll. Guard. = Colliery Guardian.
Comp.-Air Mag. = Compressed Air Magazine.
Compt. Rendus Acad. Sc. = Comptes Rendus de l'Académie des Sciences.
El. Eng. = Electrical Engineering.
El. Jl. = Electrical Journal.
El. Kraftbetr. = Electrische Kraftbetriebe und Bahnen.
Eng. Contract. = Engineering Contractor.
Eng. Min. Jl. = Engineering and Mining Journal.
Eng. News = Engineering News.
Fördertechnik = Die Fördertechnik.
Geol. Mag. = Geological Magazine.
Handel und Ind. = Handel und Industrie.
Int. Mar. Eng. = International Marine Engineering.
Inst. Min. Metal. = Institute of Mining and Metallurgy.
Int. Volkswirt = Internationaler Volkswirt.
Iron Coal Trades Rev. = Iron and Coal Trades Review.
Jl. Soc. Chem. Ind. = Journal of the Society of Chemical Industry.
Jl. Ind. Engin. Chem. = Journal of Industrial and Engineering Chemistry.
Jl. Royal Soc. Arts = Journal of the Royal Society of Arts.
Jl. S. Afr. Inst. Eng. = Journal of the South African Institute of Engineers.
Kohle Erz = Kohle und Erz.
Lumière El. = Lumière Electrique.
Min. Eng. = Mining Engineer.
Mines Minerals = Mines and Minerals.
Min. Sc. Press = Mining and Scientific Press.
Min. World Eng. Rec. = Mining World and Engineering Record.
Mon. Ind. Gaz. = Moniteur de l'Industrie du Gazet de l'Electricité.
Montan. Rdsch. = Montanistische Rundschau.
Oesterr. Z. Berg- Huttenwes. = Oesterreichische Zeitschrift fur Berg und Hüttenwesen.
Portefeuille Econ. Machines = Portefeuille économique des machines.
Proc. Acad. Pol. Sc. N. Y. = Proceedings of Academy of Political Science, New York.
Proc. Am. Inst. El. Eng. = Proceedings of American Institute of Electrical Engineers.
Proc. S. Wales Inst. Eng. = Proceedings of South Wales Institute of Engineers.
Rev. Noire = Revue Noire.
Rev. Univ. Mines = Revue Universelle des Mines.
Saarbrucker Berg. Kal. = Saarbrucker Bergmanns Kalendar.
S. Afr. Min. Jl. = South African Mining Journal.
Soz.-Technik = Sozial-Technik.
Stahl Eisen = Stahl und Eisen.
Stein-Braunkohle = Stein und Braunkohle.
Tech. Rdsch. = Technische Rundschau.
Techn. Wirtsch. = Technik und Wirtschaft.
Tekn. Tidskrift = Teknisk Tidskrift.
Trans. Inst. Min. Eng. = Transactions Institute of Mining Engineers.
Trans. Min. Inst. Scot. = Transactions of Mining Institute of Scotland.
Trans. Inst. Min. Eng. = Transactions of the Institute of Mining Engineers.
Trans. Manchester Geol. Min. Soc. = Transactions of the Manchester Geological and Mining Society.
Ung. Mont. Ind. = Ungarische Montanindustrie und Handelszeitung.
Z. Damptkessel-Betr. = Zeitschrift für Dampfkessel und Maschinenbetrieb.
Z. El. Mach. = Zeitschrift für Elektrotechnik und Maschinenbau.

Note: We shall be glad to obtain for readers, where possible, copies of the papers referred to.

## I—GENERAL

Coal. A. J. Martin. "Sci. Art. Min." vol. 23.1. pp. 15-6. (A discussion of the coal supply and its utilization.) 15c.

Digest of H. M. Inspector's Reports on Coal Mine Inspection. "Colliery Guard." vol. 104. 2695. Sp. Supp. pp. 3-26. 10 fig. 26 tab. 15c.

Valuation of Mineral Properties. C. S Morris and others. "Trans. Inst. Min. Eng." vol. 43. 4. pp. 391-4. 2 tab. (Close of the discussion.) $2.

The Conservation of Mineral Resources in the United States of America. (Die Erhaltung der Bodenschaetze in d. Vereinigten Staaten von Nordamerika." "Mitt. D. Landw. Gesellsch." 1912. 9. pp. 131-4; 10. p. 152.

British India Mines Act in Regard to Coal Mines. "Colliery Guard." vol. 104. 2694. p. 334 15c.

Mineral Resources of British Columbia. J. S. Fraser. "Canad. Min. Jl." vol. 33. 16. pp. 553-6. 40c.

Lignite Industry in Texas. W. B. Phillips. "Coal Age." vol. 2. 6. pp. 187-9. 5 tab. 10c.

The Terra del Fuego Coal Field. H. W. Edwards. "Coal Age." vol. 2. 7. pp. 222-3. 2 tab. (The product is a medium grade lignite, used exclusively in the home trade, principally for the canning industry. With some geographical and historical notes.) 10c.

Alaska Coal Land Problems. H. F. Bain. "Am. Inst. Min. Eng." Bull. 68. pp. 811-42.

On the Question of Writing-Off Capital on Account of Reduction of Substance. (Zur Frage der Abschreibungen wegen Substanzverminderung.) Bluemel. "Glueckauf." 1912. 15. pp. 596-602. (Deals with the new law concerning taxation and the considerations involved in connection with losses of coal on account of haulage.) 75c.

The Economy of Working State-owned Mines in Prussia. (Die Wirtschaftlichkeit des Staatsbetriebes im Preussuschen Bergbau.) "Z. Sozialwiss." 1912. 7. 8. pp. 546-55.

Transvaal Coal Export Trade. "S. Afric. Min. Jl." vol. 10. 490. pp. 813-4. 491. p. 859. 50c.

The English Miners' General Strike. (Der Generalstreik der Englischen bergleute.) "Gewerksch.-Rdsch." 1912. pp. 69-73. 75c.

The Coal Miner. A Study of his Struggle to secure Regulated Wages in the Hocking Valley. E. A. Saliers. Lex. 8 vo. 65 pp. Wash. Libr. of Congress, 1912. $1.

Recent Legislation in Relation to Land & Mines. A. Smith. "Colliery Guard." vol. 104. 2698. pp. 529-30. 15c.

Australian Mining Laws. A. Montgomery." "Min. Sci. Press." vol. 105. 5. pp. 141-2. 10c.

## II—GEOLOGY

Artificial Formation of Coal. Dr. Bergius. "Jl. Gas Light." vol. 119. 2572. p. 571. 25c.

Geology applied to Mine Examination. J. B. Joraleman. "Eng. Min. Jl." vol. 94. 6. pp. 247-9. 15c.

Geology of the Warwickshire Coal Field. R. D. Vernon. "Colliery Guard." vol. 104. 2696. p. 430. 1 tab. 15c.

The Coalfields of Kent, their Stratigraphic and Tectonic Conditions as Compared with those of Westphalia. (Das Kent-Kohlenfeld, seine stratographischen und tektonischen Verhaeltnisse im Vergleich mit denen des westfaelischen Steinkohlengebietes.) P. Krusch. "Glueckauf." 1912. 27. pp. 1069-78. 6 fig. 75c.

Carboniferous Succession in the Forest of Dean Coalfield. J. F. Sibley. "Geol. Mag." vol. 9. 9. pp. 417-22. (The unconformity with the carboniferous limestone and the Drybrook sandstone.)

Stratification and Grouping of Seams in the Saarbruck Carboniferous Formation. Joh. Recktenwald. (Die Schichtenreihen und Floezgruppen des Saarbruecker Steinkohlengebirges.) 8 vo. 16 pp. Kattowitz, 1912.

## III—MINING AND TECHNOLOGY

Mining Machinery. A Collection of Handbooks for Mining Officials. (Die Bergwerksmaschinen. Eine Sammlung von Handbuechern f. Betriebsbeamte.) vol. 1. 8 vo. Berlin, Juliub Springer, 1912.

Combustion Engines for Driving Mining Machinery. A. V. Coster. "Cassier's Mag." vol. 42. 2. pp. 119-29. 2 ill. (Notes upon the direct driving of fans by gas engines.)

Standard Fireproof Mine Stables. E. L. Cole. "Coal Age." vol. 2. 7. pp. 215-7. 9 fig.

The Turbo-Compressor. (Der Turbokompressor.) "Z. komprim. Gase." vol. 14, 1912. 9. p. 135-7. 5 fig. (Advantages over piston engines. Discussion of various types, cooling and regulation.)

Portable Mine Stone-Breaker with Pneumatic Drive. (Fahrbarer Gruben-Steinbrecher mit Druckluftantrieb.) Cabolet. "Glueckauf." 1912. 27. p. 1089 1 fig. 75c.

Recent systems of Automatic Feeding Devices for Pneumatic Percussion Drill. (Neuere Systeme selbsttaetiger Vorschubeinrich-tungen fuer Druckluftbohrharmmer.) Clemens Meuskens. "Kali." 1912. 6. pp. 131-5. 7 fig. 30c.

The New Harleigh Coal Breaker. F. B. Davenport. "Coal Age." vol. 2. 8. pp. 250-4. 9 fig. (The structure is relieved of considerable weight by a rigid examination of the coal and a separation of the rock and slate before it enters the breaker. The preparing house, screen floor, dumper, main conveyor, and construction of building are described.) 10c.

Power Consumption of Coal Cutters. G. W. Thomas. "Min. Minerals." vol. 33. 1. p. 8. 4 tab. 25c.

## IV—WORKING OF MINERALS

National Waste in Coal Mining. "Canad. Min. Jl." vol. 33. 16. p. 563. 40c.

Early Mining of Coal in Glace Bay District, C. B. J. C. Mitchell. "Canad. Min. Jl." vol. 33. 16. pp. 547-51. 2 maps. 1 fig. 1 ill. 40c.

Mining a Thick Vertical Coal Seam. J. W. Powell. "Coal Age." vol. 2. 7. pp. 220-1. 6. fig. (Two methods of working a mine are described. The inclined and the vertical methods are compared after the mine is opened by driving a rock tunnel from the surface to intersect the seam at the bottom of the basin, say 1,000 ft.) 10c.

European Mine Practice as it Compares With America. E. Ramsay. "Min. Eng. World." vol. 39. 8. pp. 349-51. 10c.

Caving System of Mining in America. J. B. Wilson. "Eng. Min. Jl." vol. 96. 6. pp. 245-6. 15c.

Darringer Anthracite Stripping. "Min. Minerals." vol. 33. 1. pp. 5-6. 4 fig. (The Black Creek coal pockets in Pennsylvania, and the methods of working.) 25c.

Coal Stripping in Alberta. D. B. Dowling. "Canad. Min. Jl." vol. 33. 16. pp. 543-4. 4 ill. 40c.

## V—BORING, SHAFT-SINKING AND TUNNELING

Sinking a Shaft by the Stockfish Process at the Diergradt Colliery. Krecke. (Das Schachtabborhrverfahren von Stock-

fish und seine Anwedung aud Schacht II der Gewekschaft Diergradt.) "Glueckauf." 1912. 14. pp. 552-9. 8 fig. (Description of this water-flush, percussion, system, and the appliances used for same.) 75c.

Output and Costs of Shaft-Sinking by the Freezing Method. (Leistungen und Kosten beim Schachtabteufen nach dem Degrierver-fahren.) Stegemann "Glueckauf." 1912. 11. pp. 417-24. (A full discussion of output and costs of this method for various depths and shaft-diameters.) 75c.

Pit-sinking Rules. F. Piggott. "Colliery Guard." vol. 104. 2697. pp. 482-3. 3 tab. 15c.

Shaft Sinking from Below. H. Correll. "Min. Sci. Press." vol. 105. 7. p. 211. (A shaft driven upwards from below by utilizing a borehole and a cable to support the staging below.) 10c.

Why leave Shaft Pillars. W. H. and B. H. Pickering. "Trans. Inst. Min. Engin." vol. 43. 4. pp. 428-58. 1 Plate. 2 tables. (On the waste of coal in mines which support the roof with coal pillars in situ.) $2.

## VI—BLASTING, EXPLOSIVES

External Tamping of Shots. E. Lemare. "Coal Age." vol. 2. 7. p. 225. 2 tab. (The author proposes that Taffanel barriers be placed where they will prevent an explosion, rather than so as to control one after it has started. A pile of dust in front of the shot hole serves to deaden the flame so that no gas is ignited. He calls it "external tamping.") 10c.

The Effects of Stemming on the Efficiency of Explosives. "Eng. Cont." vol. 38. 8. pp. 202-3. 12 fig.

Magazines and Thaw Houses for Explosives. "Eng. Cont." vol. 38. 7. p. 185-8. 15 fig. 1 tab.

How Explosives Act. O. Snelling. "Coal Age." vol. 2. 5. p. 145. 10c.

The Danger of Accidents in Firing with Electric Ignition or with Fuse Ignition. (Die Unfallgefahr bei der Schiessarbeit mit elektrischer Gruendung u. mit Zuendschnurzuendung.) Dobblestein. "Glueckauf." 1912. 15. pp. 594-6. (Results of an inquiry in the Dortmund district on the accidents during 1908-11. The number of accidents underground per 1000 men was not smaller—at times even larger with electric than with fuse ignition.) 75c.

## VII—TIMBERING, PACKING, ETC.

A Water-tight Timber Shaft. R. G. Johnson. "Coal Age." vol. 2. 6. pp. 178-9. 4 fig. (Cement grout was forced into the water carrying fissures and the timber shaft rendered comparatively dry.) 10c.

Mining by Timbering and Filling. A. L. Toenges. "Min. Minerals." vol. 33. 1. pp. 36-8. 6 fig. 25c.

## VIII—WINDING AND HAULAGE

Hoisting on Inclines. A. O. Gates. "Eng. Min. Jl." vol. 94. 7. p. 290-1. 1 chart. 1. fig. (The colution of forces in hoisting on inclines.) 15c.

Power Consumption of Hoisting Plants. S. W. Sykes. "Min. Minerals." vol. 33. 1. pp. 49-52. 7 fig. 25c.

The Speed Regulators of Steam Hauling Engines with special Consideration of Schoenfeld's System. (Die Fahrtregler der Dampffoerdermaschinen mi besonderer Berucksichtigung des Systems Schoenfeld.) Gentebrueck. "Techn. Bl. (Bergwerks-Ztg.)" 1912. 11. pp. 81-4. 3 fig. 40c.

Conveyance of Workmen Underground. W. H. Pickering. "Colliery Guard." vol. 104. 2695. pp. 379-80. 7 fig. (Tne endless rope system is in most cases not suitable for the conveyance of men as well as minerals. Two systems of light haulage and the special carriages suitable for the purpose, as already in use, are described.) 15c.

Mine Cages, Inclined Shaft Trolleys and Hanging Chutes. C. T. Rice. "Eng. Min. Jl." vol. 94. 8. pp. 347-9. 17 fig. 15c.

A Method of Capping Winding Ropes. D. Jackson. "Trans. Inst. Min. Engin." vol. 43. 3. pp. 331-4. 6 fig. $2.

Largest Electrical Mine Hoist in America. "El. Rev. (Chic.)" vol. 61. 5. pp. 227-8. (The Christopher Coal Mining Co.'s hoist, Franklin County, Ill. The hoist takes half the capacity of a plant of two 750-kw., 3-phase, 60-cycle, 2,300-volt Curtis turbo-generators.)

Storage Battery Haulage at Idaho Springs, Col. H. B. Barnes. pp. 100-2. 1 fig. (Experience of service and cost at Big Five Tunnel.)

## IX—SIGNALLING

The Use of Telephones in Mines. G. Brown. "Coal Age." vol. 2. 6. pp. 179-81. 2 fig. (Practical suggestion on the best methods of wiring and maintenance underground.) 10c.

## X—LIGHTING

The Ignition Properties of Electric Glow Lamps. "Gas World." vol. 57. 1467. p. 257. 2 tab. (The power of ignition of broken glow lamps in mixtures of gases and air.) 15c.

The Fors Miners' Electric Lamp. H. F. Joel. "Colliery Guard." vol. 104. 2695. p. 380. 3 fig. (The Home Office $250 prize lamp.) 15c.

Official Testing of Safety Lamps. Redmayne and Others. "Colliery Guard." vol. 104. 2698. pp. 531-3. 1 fig. 15c.

The Ceag Miner's Electric Lamp. C. Farber. "Colliery Guard." 104. 2695. pp. 384-5. 3 fig. (The Home Office $3000 prize miner's electric lamp.) 15c.

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